

**BEFORE
THE PUBLIC UTILITIES COMMISSION OF OHIO**

In the Matter of the Application of the Ohio)	
Edison Company, the Cleveland Electric)	
Illuminating Company and the Toledo Edison)	Case No. 14-1297-EL-SSO
Company for Authority to Provide for a Standard)	
Service Offer Pursuant to R.C. 4928.143)	
In the Form of an Electric Security Plan)	

**Supplemental Testimony of
Tyler Comings**

Redacted Version

**On Behalf of
Sierra Club**

May 11, 2015

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List of Exhibits:

Confidential Exhibit TFC-34: IGS Set 1 RPD-002 and -003 Attachments 1, 2, 10, 11, 12, 13-Confidential (excerpts)

Competitively Sensitive Confidential Exhibit TFC-35: SC Set 1-INT-16 Attachment 1
- Competitively Sensitive Confidential

Competitively Sensitive Confidential Exhibit TFC-36: SC Set 1-INT-10, Attachment 1
- Competitively Sensitive Confidential

Competitively Sensitive Confidential Exhibit TFC-37: SC Set 1-INT-9, Attachment 1
- Competitively Sensitive Confidential

Exhibit TFC-38: Funk, John. "Gas-fired power plants sprouting in Ohio to replace old coal-burners". The Plain Dealer. April 9, 2015. Available here:
http://www.cleveland.com/business/index.ssf/2015/04/gas_fired_power_plants_sprouti.html

Exhibit TFC-39: http://www.puco.ohio.gov/puco/index.cfm/be-informed/consumer_topics/where-does-ohioe28099s-electricity-come-from/#sthash.g1XcHWMO.dpbs

Exhibit TFC-40: PJM 2015 Winter Observations Update. April 7, 2015, available at:
http://www.pjm.com/~media/committees-groups/committees/toa_ac/20150407/20150407-winter-update.ashx

Competitively Sensitive Confidential Exhibit TFC-41: SC Set 1-RPD-9, Attachment 1
- Competitively Sensitive Confidential

Exhibit TFC-42: Transcript of the Deposition of Sarah Murley, January 14, 2015 (excerpts)

1 **I. INTRODUCTION AND PURPOSE OF TESTIMONY**

2 **Q Please state your name, business address, and position.**

3 **A** My name is Tyler Comings. I am a Senior Associate with Synapse Energy
4 Economics, Inc. (Synapse), which is located at 485 Massachusetts Avenue, Suite
5 2, Cambridge, Massachusetts.

6 **A Are you the same Tyler Comings who filed testimony in this matter on**
7 **December 22, 2014?**

8 **A** Yes.

9 **Q What is the purpose of your supplemental testimony?**

10 **A** My supplemental testimony addresses the application of Ohio Edison Company,
11 The Cleveland Electric Illuminating Company, and The Toledo Edison Company
12 (“the Companies”) for approval of an electric security plan (“ESP”) in light of the
13 Commission order regarding Ohio Power Company’s (“AEP Ohio”) ESP in Case
14 Nos. 13-2385-EL-SSO and 13-2386-EL-AAM (“the AEP Ohio Order”). In
15 particular, my supplemental testimony focuses on the Commission’s ruling on the
16 power purchase agreement (“PPA”) rider proposed by AEP Ohio and the
17 significance of that ruling for this case,¹ and on the new analyses and theories
18 offered in the Companies’ May 4, 2015 supplemental testimony. After reviewing
19 the AEP Ohio Order, more up-to-date information that became available since my
20 direct testimony was filed, and the Companies’ supplemental testimony, I find
21 that:

- 22 1. The value of the proposed transaction with FirstEnergy Solutions Corp.
23 (“FES”) – and the potential savings to ratepayers under the proposed
24 Retail Rate Stability Rider (“Rider RRS”) – has likely decreased further
25 given recent market expectations;

¹ See generally *In re Ohio Power Co.*, Case No. 13-2385-EL-SSO, et al., Opinion and Order, at 23-26 (Feb. 25, 2015).

- 1 2. The proposed transaction and Rider RRS could turn low market prices
- 2 from being a benefit to a vulnerability for ratepayers;
- 3 3. Rider RRS would expose ratepayers to further risk and would not provide
- 4 retail-rate stability;
- 5 4. The Companies have likely overstated whatever transmission reliability
- 6 cost savings might accrue from Rider RRS;
- 7 5. The Companies' economic impacts analysis of the transaction is
- 8 incomplete and flawed.

9 **Q Are there any exhibits that accompany your testimony?**

10 **A Yes. I am attaching Exhibits TFC-34 to TFC-42.**

11 **II. THE VALUE OF THE TRANSACTION HAS LIKELY DECREASED**

12 **Q Is the PPA rider discussed in the AEP Ohio Order similar to the Rider RRS**
13 **being proposed by the Companies here?**

14 **A Yes. In both cases, the utility has proposed a non-bypassable rider that would tie**
15 utility's customers to an underlying transaction that involves the purchase of
16 energy, capacity, and ancillary services from certain generating units. The effect
17 of this, under both proposals, is to essentially turn ratepayers into merchant
18 generators by transferring all of the costs, revenues, and economic risks
19 associated with those units to ratepayers. Both transactions even involve some of
20 the same generating units. AEP Ohio and FES both currently own shares of the
21 Ohio Valley Electric Corporation ("OVEC") units, and the Companies and AEP
22 Ohio both proposed transferring the costs and revenues associated with their
23 OVEC shares to ratepayers. The scale of the Companies' rider proposal is much
24 greater, however, because the Companies' proposed transaction with FES also
25 includes the costs and revenues associated with the FES-owned W.H. Sammis and
26 Davis-Besse plants.

1 **Q In its Order, did the Commission consider the rider’s potential costs and**
2 **savings to ratepayers?**

3 **A** Yes. In rejecting AEP Ohio’s PPA rider proposal, the Commission repeatedly
4 stressed the potential net costs to customers.² The Commission noted “that the
5 rider would impact customers’ rates through the imposition of a new charge on
6 their bills,” and considered the evidence regarding “how much the proposed PPA
7 rider would cost customers.”³ In addition, the Commission signaled that it will
8 consider the generating units’ profitability is evaluating future proposals.⁴

9 **Q Did the Commission’s Order find that AEP Ohio’s PPA Rider would provide**
10 **net benefits to customers?**

11 **A** No. The Commission found that the benefits of AEP’s PPA rider were not clear
12 and “that, during the three-year period of the ESP, the PPA rider would, in all
13 likelihood, result in a net cost to customers”⁵

14 **Q Should this concern also apply to the Companies’ proposed transaction?**

15 **A** Absolutely. The Companies’ own filing projected that ratepayers would lose \$404
16 million, on a net present value basis, in 2016-18 if Rider RRS were approved.⁶
17 Moreover, as shown in my direct testimony, under the Companies’ projections the
18 proposed transaction [REDACTED]
19 [REDACTED]. Using FES’s [REDACTED]
20 [REDACTED], which [REDACTED] forecasts relied on by the Companies, the
21 proposed transaction [REDACTED] [REDACTED]⁷ These [REDACTED]

² AEP Ohio Order at pp. 23-25.

³ *Id.* at p. 23.

⁴ As the Attorney Examiner noted, in the AEP Ohio Order the Commission stated it would balance, but not be bound by, several factors “in deciding whether to approve future cost recovery requests associated with PPAs.” Case. No. 14-1297-EL-SSO, Entry ¶ 4. One of these factors is the “financial need of the generating plant.” *Id.*

⁵ AEP Ohio Order, p. 24; *see also id.* (“Although the magnitude of the impact of the proposed PPA rider cannot be known to any degree of certainty, the Commission agrees with OCC, IEU-Ohio, and other intervenors that the evidence of record reflects that the rider may result in a net cost to customers, with little offsetting benefit from the rider’s intended purpose as a hedge against market volatility.”).

⁶ Direct Testimony of Jay A. Ruberto, Attachment JAR-1 Revised (Nov. 14, 2014).

⁷ Direct Testimony of Tyler Comings, p. 11, Table 2.

1 [REDACTED] show some of the underlying uncertainty of the variables used in valuing
2 this transaction. In evaluating its own plants, FES used [REDACTED]
3 [REDACTED]
4 [REDACTED] of
5 annual net costs or revenues for the proposed transaction. This uncertainty is
6 compounded by the fact that [REDACTED] suffered
7 from the use of a simplistic spreadsheet model and did not adequately account for
8 future regulatory costs.

9 **Q Did you conduct alternative analyses to the Companies' valuation of the**
10 **proposed transaction?**

11 **A** Yes. In preparing my December 22, 2014 testimony, I modeled changes in
12 capacity prices, energy prices, and additional environmental control costs in order
13 to highlight uncertainties and risks that the Companies neglected to evaluate. In
14 particular, I presented estimates of the valuation using a band of energy prices that
15 were 10 percent lower and 10 percent higher than those used by the Companies. A
16 lower or higher energy price leads to a lower and higher valuation, respectively,
17 relative to the Companies' original results presented by Witness Lisowski. For
18 instance, Sammis and the OVEC units [REDACTED],
19 respectively, when assuming a 10 percent lower energy price than that assumed
20 by the Companies.⁸ These results were [REDACTED] FES's results, which showed that
21 Sammis and the OVEC units would not [REDACTED],
22 respectively.

23 **Q Have the Companies or FES provided updated valuation estimates since**
24 **your direct testimony was filed?**

25 **A** No. The Companies' supplemental testimony is conspicuously devoid of any
26 updated valuation estimates. And when Sierra Club asked in discovery for any
27 such updated information, including any projected costs and revenues for the

⁸ *Id.*

1 generating plants, the Companies objected and provided no new substantive
2 information.⁹

3 **Q In your direct testimony, did you advocate that a higher or lower energy**
4 **price was a more likely outcome compared to the Companies' estimates?**

5 **A** I advised that lower energy prices—and therefore a lower valuation of the
6 proposed transaction—were more likely.¹⁰ This conclusion was based on
7 changing expectations of natural gas prices, which is a key driver of wholesale
8 energy prices. My direct testimony compared the Companies' forecast (produced
9 by Mr. Rose at ICF) to NYMEX future prices from December 17, 2014. The ICF
10 forecast relied on NYMEX futures for its forecast of 2015 and 2016 prices;
11 however, more up-to-date NYMEX futures showed a decrease of 18 percent in
12 2015 and 11 percent in 2016 relative to ICF's predictions in those years.¹¹ I also
13 compared the Energy Information Administration's ("EIA") Annual Energy
14 Outlook forecast for 2014 ("AEO 2014") to ICF's forecast through 2031, and
15 found that the AEO 2014 forecasted [REDACTED].¹²

16 **Q Have you looked at natural gas price forecasts since you filed your direct**
17 **testimony on December 22, 2014?**

18 **A** Yes. I have looked at more recent NYMEX futures and the recently-released EIA
19 Annual Energy Outlook for 2015 (AEO 2015).¹³ Both sets of forecasts indicate
20 that the ICF natural gas forecast relied on by the Companies in their application
21 likely [REDACTED] future natural gas prices. As shown in Table 1,
22 NYMEX futures have decreased even further since my direct testimony was filed.
23 When the NYMEX futures pulled on May 11, 2015, are compared to the ICF

⁹ See Resps. to SC Set 9-INT-163, 164; SC Set 9-RPD-128, 132, 133; SC Set 10-INT-178, 179, 180.

¹⁰ Direct Testimony of Tyler Comings, p. 49, line 9: [REDACTED] on the low energy price sensitivity."

¹¹ Direct Testimony of Tyler Comings, p. 27, Table 6.

¹² Direct Testimony of Tyler Comings, p. 28, Figure 6.

¹³ EIA AEO 2015. Available here: <http://www.eia.gov/oiaf/aeo/tablebrowser/>

1 forecast used in the Companies' application, they show that natural gas prices are
2 31 percent lower for 2015 and 24 percent lower for 2016.

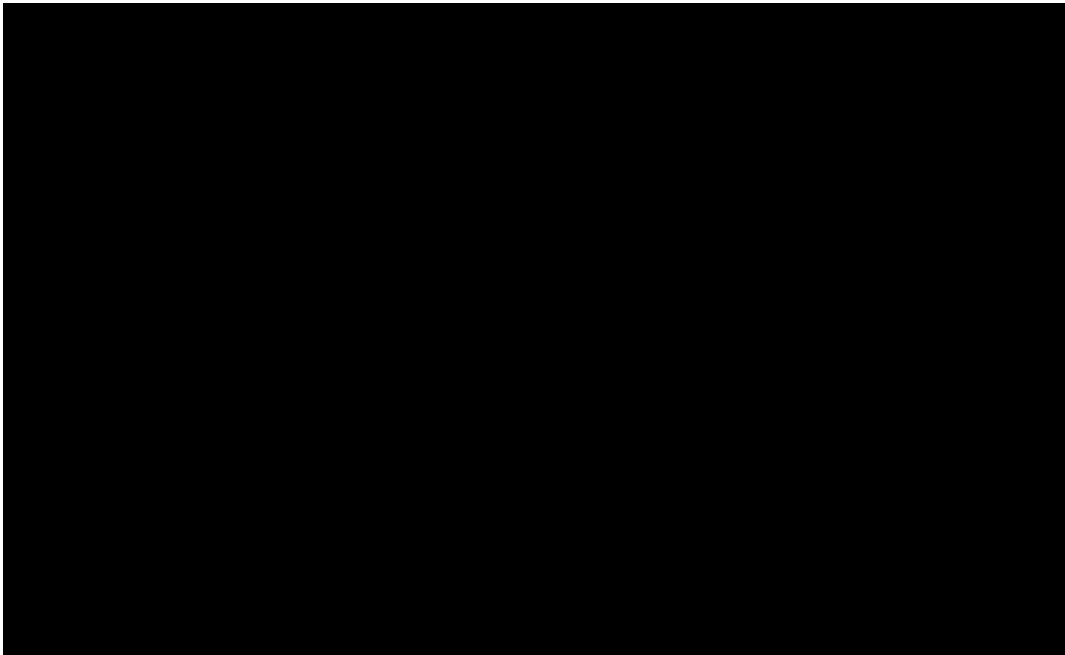
3 **Table 1: Updated Natural Gas Price Forwards (Henry Hub, \$/MMBtu)**¹⁴
4

	ICF Forecast (based on NYMEX Futures)	NYMEX Futures pulled on 5/11/15	% change from ICF forecast
2015	\$4.34	\$3.01	-31%
2016	\$4.28	\$3.25	-24%

5

6 This dynamic is [REDACTED] the long-term AEO 2015 forecast. CONFIDENTIAL
7 Figure 1 shows that the ICF natural gas price forecast used by Mr. Rose in this
8 proceeding [REDACTED]
9 [REDACTED]. The AEO 2015 forecast for 2015 and 2016 prices is still higher
10 than recent NYMEX futures. Given the availability of more up-to-date outlooks
11 for natural gas prices, ICF's forecasts are likely [REDACTED]
12 [REDACTED].

¹⁴ NYMEX forwards from May 11, 2015, were pulled from:
http://www.cmegroup.com/trading/energy/natural-gas/natural-gas_quotes_settlements_futures.html
ICF forecast from Direct Testimony of Judah Rose, p. 47, Table 8.



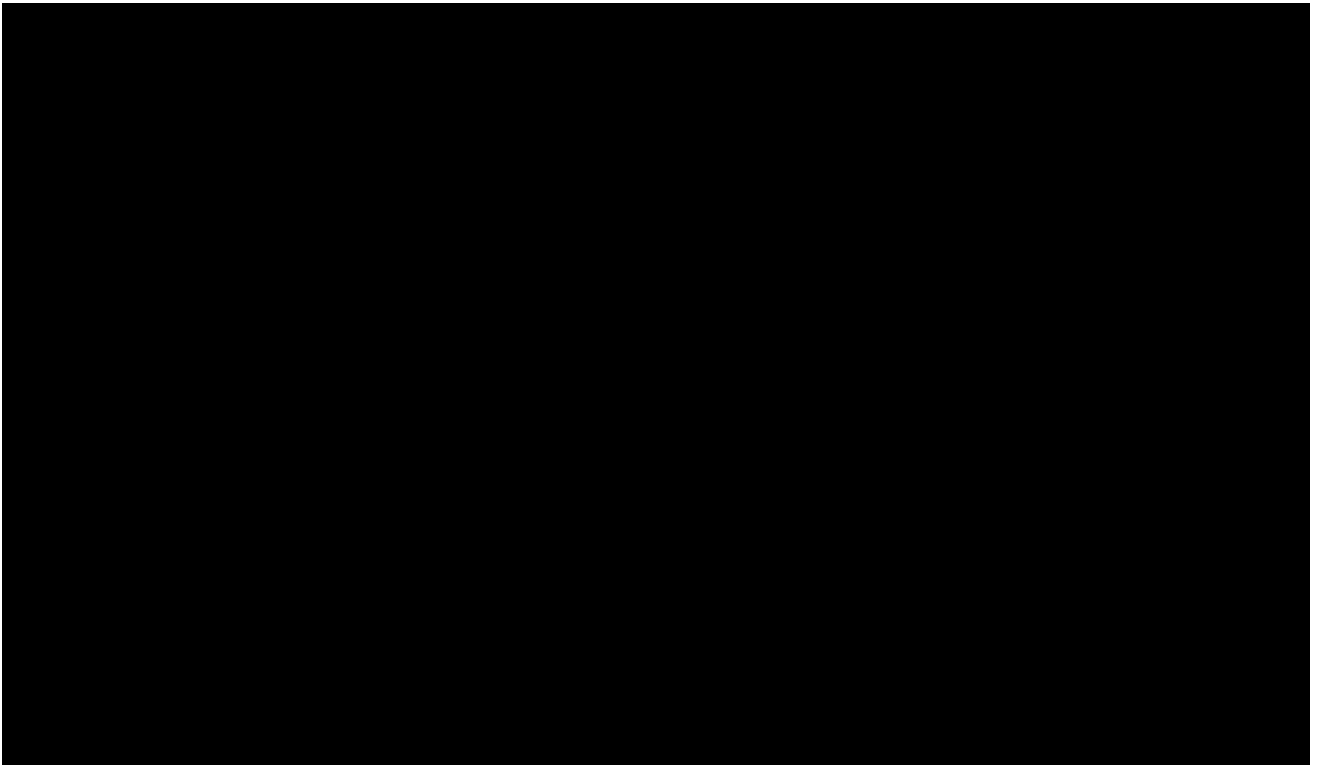
1
2 **CONFIDENTIAL** Figure 1: Comparison of Natural Gas Price Forecasts
3 (\$/MMBtu)¹⁵

4 **Q Did you compare ICF forecasts from previous years to actual natural gas**
5 **prices?**

6 **A** Yes. CONFIDENTIAL Figure 2 shows ICF forecasts for Henry Hub natural gas
7 prices produced from 2010 through the first quarter of 2015 (Q1 2015) and actual
8 spot prices from 2010 through first quarter of 2015. For the most part, ICF's
9 trajectories have [REDACTED]
10 [REDACTED] than the fourth quarter 2014
11 forecast (Q4 2014). It is unsurprising that forecasts have [REDACTED]
12 [REDACTED], given that most natural gas price forecasts produced in 2010 and 2011
13 [REDACTED] actual prices in subsequent years significantly. However, even
14 ICF's recent forecasts [REDACTED]
15 [REDACTED]. In particular, for the past five years, [REDACTED]
16 [REDACTED]

¹⁵ Direct Testimony of Judah Rose, p 87 Attachment II. AEO 2015 prices are available here:
<http://www.eia.gov/oiaf/aeo/tablebrowser/>

1 As shown below, the ICF forecast used by Mr. Rose in this filing includes [REDACTED]
2 [REDACTED] compared with the two most recent forecasts provided by ICF
3 (Q4 2014 and Q1 2015). [REDACTED]
4 [REDACTED] monthly Henry Hub prices for January through
5 March of 2015 have been below \$3/MMBtu. Even the more recent ICF forecast
6 predicts [REDACTED] As shown in CONFIDENTIAL Figure 1 above, the
7 market's expectations for the rest of 2015 and 2016 remain around the \$3 range.



8
9 **CONFIDENTIAL** Figure 2: Comparison of ICF Natural Gas Price Forecasts to
10 Actual Prices (Henry Hub/\$/MMBtu)¹⁶

¹⁶ Past ICF natural gas price forecasts were provided in the Companies' responses to IGS Set 1 RPD-002 and -003, and are attached to my testimony as Exhibit TFC-34 (Confidential). If more than one forecast was generated in a given year, the earliest forecast was selected for this figure. Translation of past forecast prices from real to nominal dollars assumed a 2.1% inflation rate, the same rate assumed in Witness Rose's testimony. "ICF used in filing" is directly from confidential Attachment II to Witness Rose's testimony. "Actual Prices" are annual average Henry Hub spot prices—2015 prices are from January through March. Available here: <http://www.eia.gov/dnav/ng/hist/rngwhhdm.htm>

1 **Q Given that ICF's natural gas prices used in this filing are likely too high, how**
2 **should the Companies proceed?**

3 **A** As it stands, the Companies' results presented by Mr. Lisowski are predicated on
4 natural gas and energy price expectations that are outdated and likely too high. At
5 a bare minimum, the Companies should re-evaluate the proposed transaction with
6 more up-to-date, reasonable natural gas prices and energy prices to reflect current
7 market expectations.

8 **Q In your alternative analysis, which sensitivity would you expect to have a**
9 **higher probability of occurring—higher or lower energy prices?**

10 **A** My analysis using a 10 percent lower energy price (compared to the Companies'
11 price) is more reasonable given changes in market expectations. This adjustment
12 alone would [REDACTED] the Companies had
13 estimated for the Sammis and OVEC units. Holding other factors constant, a 10
14 percent decrease in energy prices would reduce the net present value of Sammis
15 [REDACTED] over the next 15 years, and the net present value
16 of OVEC [REDACTED] over that same time frame.¹⁷

17 **Q Is your lower energy price forecast the one that should be relied upon by the**
18 **Companies?**

19 **A** Not necessarily. My forecast is a simple sensitivity that was used to demonstrate
20 how the results would change under different market expectations. It is not meant
21 to be the definitive energy price forecast. For instance, if a higher carbon price
22 were assumed--as I advocate it should be in my direct testimony-- this could, all
23 else being equal, be met with an increase in energy prices once the carbon price
24 takes effect.¹⁸ Importantly, however, the value of a coal unit would decrease
25 further under this scenario because it is more carbon-intensive than the system at-
26 large. Therefore, a coal unit's operating costs per unit of energy produced would
27 increase more than any resulting increase in the market price of the energy.

¹⁷ Direct Testimony of Tyler Comings, Competitively Sensitive Confidential Table 1.

¹⁸ Direct Testimony of Tyler Comings, p.8, lines 8-17.

1 **Q** [REDACTED]
2 [REDACTED]
3 **A** [REDACTED]
4 [REDACTED]
5 [REDACTED]
6 [REDACTED]
7 [REDACTED]
8 [REDACTED]
9 [REDACTED]
10 [REDACTED]
11 [REDACTED].

12 **Q** **Have the Companies provided updated information on the plants’ revenues**
13 **collected since you filed your direct testimony on December 22, 2014?**
14 **A** Yes, in supplemental testimony filed on May 4th, the Companies provided
15 information on revenues from Sammis and Davis-Besse through the end of 2014.
16 When asked to update this information in discovery, they objected and provided
17 no new information.¹⁹ However, they saw fit to include this information in
18 supplemental testimony. Before I filed my direct testimony, the Companies had
19 provided energy and capacity revenues with actual data through June of 2014 and
20 projections thereafter.²⁰

21 **Q** **Have you reviewed this more recent data on revenue generated by the**
22 **Sammis plant?**
23 **A** Yes. The Companies’ projections of revenues and costs differed from the actual
24 results in 2014, as presented in Mr. Moul’s supplemental testimony.²¹ Shown in

¹⁹ Companies’ Response to SC Set 10-INT-182. More generally, the Companies have stymied efforts to obtain updated cost and revenue information, and related operational data, for the plants. *See, e.g.*, Companies’ Resps. to SC Set 10-INT-176, 177, 179, 180, 181, 183.
²⁰ SC Set 1-INT-16 Attachment 1 - Competitively Sensitive Confidential, attached as Competitively Sensitive Confidential Exhibit TFC-35.
²¹ Supplemental Testimony of Donald Moul, p. 2, Figure 1.

COMPETITIVELY SENSITIVE CONFIDENTIAL Table 2, the Companies' previously projected a profit of [REDACTED] in 2014 (or revenues of [REDACTED] minus costs of [REDACTED]). The actual data presented in Mr. Moul's supplemental testimony shows a profit of [REDACTED] (or revenues of [REDACTED] minus costs of [REDACTED]). The Companies overestimated revenues by [REDACTED] ([REDACTED]) and costs by [REDACTED] ([REDACTED])—leading to an overestimation of profits by [REDACTED] ([REDACTED]).

COMPETITIVELY SENSITIVE CONFIDENTIAL Table 2:
Sammis Revenues and Costs in 2014²²

	Companies' Projection*	Actual	Companies' Overestimate (mil)	Companies' Overestimate (%)
Total Revenues	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Total Costs	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Profit	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

* Includes actual revenues and costs for first half of 2014 plus Companies' revenue projection for the second half of 2014.

Q Are all of the revenues and costs that ratepayers would bear in the proposed transaction seen in the Companies' actual and projected 2014 costs and revenues?

A No. The proposed transaction would pass through costs and revenues like those shown above for 2014, however, it would also include a return on equity that the Companies would pay to FES and recover from ratepayers for the Sammis plant. In 2017, the first full year of the transaction, this additional cost is [REDACTED].²³ Therefore, in order for the plant to produce a net profit to ratepayers, the plants revenues would have to cover the costs of operation (shown above for 2014) and the requested return on equity each year. This additional cost to ratepayers would make it much more difficult for them to see net gains from the proposed transaction and Rider RRS.

²² *Id.*; SC Set 1-INT-16 Attachment 1 - Competitively Sensitive Confidential.

²³ Testimony of Jason Lisowski, Attachment JLL-1- Competitively Sensitive Confidential; Competitively Sensitive Confidential Exhibit TFC-2.

1 **Q Have you estimated the energy revenues generated by Sammis for 2015, so**
2 **far?**

3 **A** Yes. I have estimated Sammis's energy revenue for 2012, 2013, 2014, and
4 January through March of 2015 using three publicly available sets of data: 1)
5 hourly day-ahead Locational Marginal Price (LMP) for AEP-Dayton Hub, 2)
6 hourly gross load by unit reported to the U.S. Environmental Protection Agency
7 (EPA), and 3) the net generation for the plant reported to the EIA.

8 This method of estimating revenues appears to be reliable. As shown in

9 CONFIDENTIAL Table 2, estimating the revenue using this method
10 came within █████ percent of the Companies' actual energy revenue in 2012,
11 2013, and 2014. Applying the same methodology, I find that the Companies'
12 projected energy revenue for 2015 is on-track to be █████; this
13 represents an █████ of approximately █████ by the Companies—
14 assuming plant operations and energy prices are similar for the rest of 2015.

15 **COMPETITIVELY SENSITIVE CONFIDENTIAL Table 3: Sammis**
16 **Energy Revenue for 2012, 2013, 2014, and 2015 (January-March)²⁴**
17

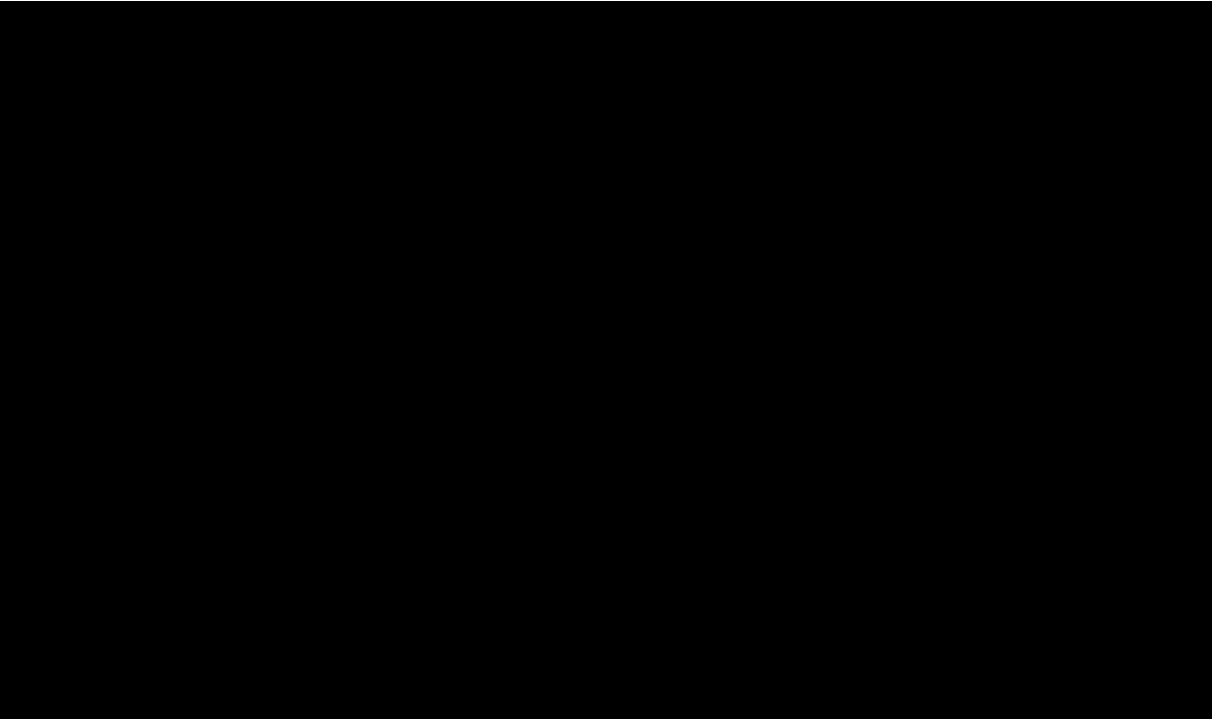
Year	Energy revenue reported by the Companies (\$mil)	Energy revenue estimate (\$mil)	Difference (\$mil)	Difference (%)
2012	████	\$284	████	████
2013	████	\$446	████	████
2014	████	\$565	████	████
2015	████	\$405	████	████

²⁴ The Companies' reported energy revenue is from SC Set 1-INT-16, Attachment 1 - Competitively Sensitive Confidential for 2012, 2013 and 2015 (which is the Companies' projection of revenue). Data for 2014 is based on reported energy revenue from Mr. Moul's Competitively Sensitive Confidential Supplemental Workpapers. My revenue estimate, shown in the second column of Confidential Table 3, is based on actual hourly generation and prices through March 2015. The annualized 2015 result is based on revenue from January through March and number of hours (\$405 million = \$100 million*(8760 hours in a year)/(2160 hours from January through March). Gross unit generation is pulled from EPA's Air Markets Program Data, which is available at: <http://ampd.epa.gov/ampd/>. Net plant generation is pulled from EIA's Electricity Data Browser, Plant level data report, which is available at: <http://www.eia.gov/electricity/data/browser/>. Hourly energy prices are pulled from PJM, which is available at: <http://www.pjm.com/markets-and-operations/energy/real-time/lmp.aspx>.

1 **Q Are the Companies projecting that the Sammis plant will operate more often**
2 **and generate more energy revenue in future years?**

3 **A** Yes. As shown in COMPETITIVELY SENSITIVE CONFIDENTIAL Figure 3,
4 despite the plant operating at 57 percent capacity factor on average for the past
5 five years, the Companies are projecting between [REDACTED] capacity
6 factor for 2015 through 2031.²⁵ The Companies' assumed [REDACTED]
7 [REDACTED] leads the plant to be [REDACTED] in the market and, therefore,
8 projected to dispatch [REDACTED]. The Companies' expectation of a [REDACTED]
9 [REDACTED] in 2015 and [REDACTED] for the following 16 years
10 relies on the [REDACTED] that [REDACTED] in
11 2015 and be [REDACTED] for the next 16 years. Without this [REDACTED]
12 [REDACTED], the plant would run [REDACTED] and generate [REDACTED] than
13 expected—indeed, [REDACTED].

²⁵ Net plant generation from EIA's Electricity Data Browser, Plant level data report. Available here: <http://www.eia.gov/electricity/data/browser/>. Gross unit generation is pulled from EPA's Air Markets Program Data, which is available at: <http://ampd.epa.gov/ampd/>. The capacity factor was calculated using net generation from EIA. March 2015 net generation was not reported to EIA at the time so the EPA gross generation for that month was adjusted by a fixed factor (based on the historical relationship of net and gross generation).



COMPETITIVELY SENSITIVE CONFIDENTIAL Figure 3: Sammis
Historical and Projected Annual Capacity Factor²⁶

Q Is the Sammis plant going to reach an [REDACTED] in 2015, as projected by the Companies?

A Based on performance in the first quarter of 2015, the plant is [REDACTED]. As shown in CONFIDENTIAL Figure 3 above, from January through March of 2015, the plant has run at a 50 percent capacity factor—slightly below the 57 percent five-year historical average and [REDACTED] by the Companies.²⁷ In order to [REDACTED], the plant would have to operate [REDACTED], which is highly unlikely.²⁸

²⁶ *Id.* Companies' projected capacity factor: SC Set 1-INT-10, Attachment 1 - Competitively Sensitive Confidential, attached as Competitively Sensitive Confidential Exhibit TFC-36.

²⁷ *Id.*

²⁸ The calculation is as follows: ((Jan through March hours= 2160)*50% CF+ (April through December hours= 6600)* [REDACTED] % CF) / (January through December hours= 8760) = [REDACTED] % annual CF

1 **Q Do you have the same concern with the Companies' projected performance**
2 **for the OVEC units?**

3 **A** Yes, but not to the same extent. The OVEC units' historical average capacity
4 factor from 2010-2014 was 64 percent and the Companies expect them operate at
5 [REDACTED] from 2015-2031.²⁹ This is a small difference. However,
6 it is noteworthy that the OVEC units have operated at 58 percent for the first
7 quarter of 2015 compared to [REDACTED] for
8 that year. In order to reach this projected level, the OVEC units would have to
9 operate [REDACTED].³⁰

10 **Q Are there other more recent developments that would lead to lower future**
11 **energy prices than those assumed by the Companies—all else equal?**

12 **A** Yes. Projections of peak load and energy requirements in the region are now
13 lower than the projections relied on by Mr. Rose in developing his market price
14 forecasts. A decrease in energy requirements should lead to a decrease in energy
15 prices, or would at least reduce projected increases in such prices.

16 In January of this year, PJM released its 2015 load and energy forecasts for zones
17 in that region. Mr. Rose used the previous year's PJM load forecast for the energy
18 price forecast he provided to the Companies.³¹ The 2015 PJM load forecast report
19 explains:

20 The introduction of a binary variable into the load forecast model
21 for years 2013 and 2014 resulted in generally lower peak and
22 energy forecasts in this year's report, compared to the same year in
23 last year's report. PJM introduced this change as a short-term
24 solution as it pursues its announced intention to better reflect usage
25 trends such as adoption of more energy efficient end uses and

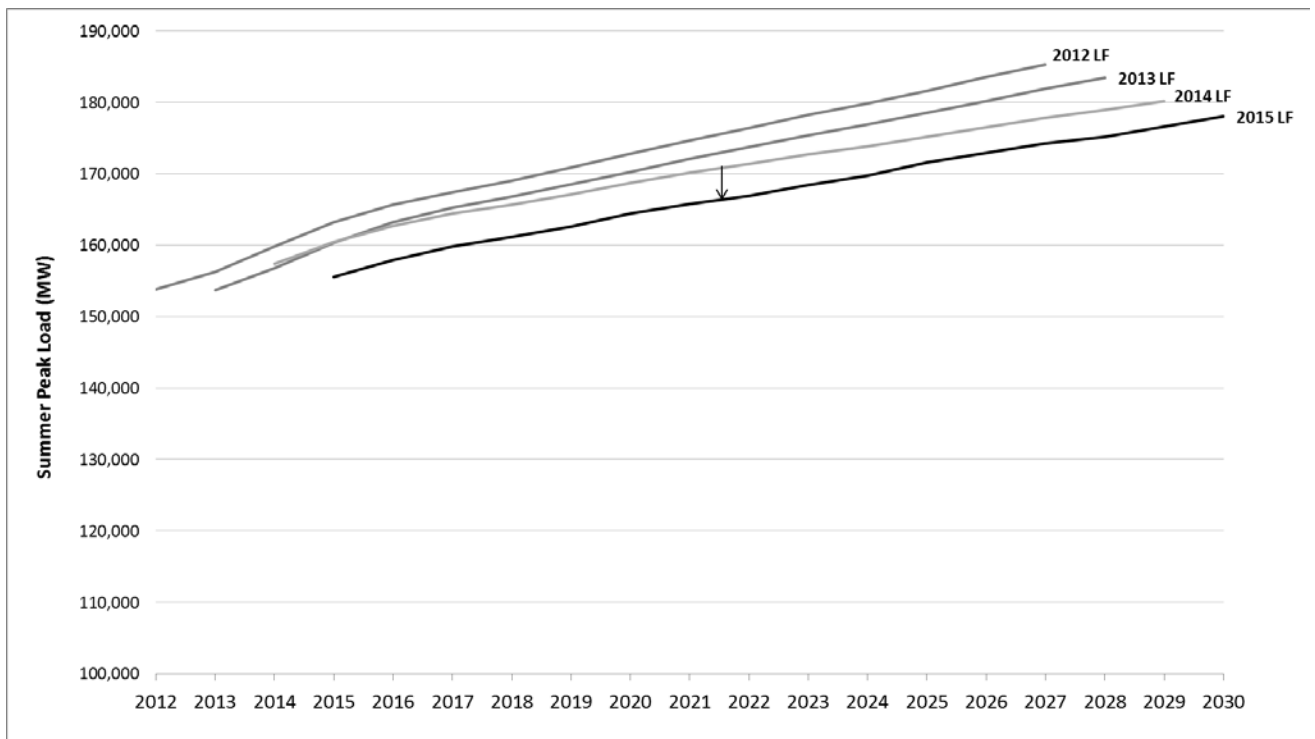
²⁹Companies' projected capacity factor: SC Set 1-INT-10, Attachment 1 - Competitively Sensitive Confidential. Companies' historical capacity factor: SC Set 1-INT-9, Attachment 1 - Competitively Sensitive Confidential, attached as Competitively Sensitive Confidential Exhibit TFC-37.

³⁰ The calculation is as follows: ((Jan through March hours= 2160)*58% CF+ (April through December hours= 6600)* [REDACTED] % CF) / (January through December hours= 8760) = [REDACTED] % annual CF

³¹ Direct Testimony of Judah Rose, p. 50, lines 9-10.

1 behind the meter generation which are not currently captured in the
2 forecast model.³²

3 Figure 4 shows, in part, the effect of this change in PJM’s load forecasting. The
4 effect is seen immediately in that peak load expectations in 2015 have decreased
5 by 3 percent in the region. Expectations for load in the ATSI zone have decreased
6 by 2 percent for 2015 (274 MW), and such decrease persists through 2030 with an
7 approximately 1.9 percent decrease (266 MW) compared to the PJM 2014 load
8 forecast relied upon by Mr. Rose in this proceeding.³³



9
10 **Figure 4: PJM’s 2012-2015 Gross Peak Load Forecasts (“LF”)³⁴**

³² PJM Load Forecast Report, January 2015, p.1. Available here:

<https://www.pjm.com/~media/documents/reports/2015-load-forecast-report.ashx>

³³ *Id.* Table A-1.

³⁴ PJM Load Forecast Reports from 2012 through 2015, Table B-1.

1 **Q Do these reduced peak load expectations have implications for capacity**
2 **prices as well?**

3 **A** Yes. All else equal, a decrease in projected load requirements would lead to a
4 decrease or no change in projected capacity prices. The Companies' valuation of
5 the proposed transaction assumed [REDACTED] in PJM capacity prices for the
6 forthcoming 2018/2019 auction [REDACTED] after that point—despite
7 historical evidence of fluctuating capacity prices.³⁵

8 As described in my direct testimony, I ran a sensitivity that started from the
9 \$120/MW-day result in the 2017/2018 auction, increasing to \$ [REDACTED]/MW-day in the
10 next year and subsequently increasing with inflation to \$ [REDACTED]/MW-day in the
11 2030/2031 planning year. This adjustment was markedly lower than the
12 Companies' assumption of \$ [REDACTED]/MW-day for the next auction, increasing to
13 \$ [REDACTED]/MW-day in the 2030/2031 planning year. Applying my adjustment alone
14 reduced the value of the proposed transaction by [REDACTED]: \$ [REDACTED] million
15 compared to \$ [REDACTED] million.³⁶ Given the downward pressure on prices from
16 decreased load expectations, it is possible that my price projection overestimates
17 capacity prices. While I have not updated my assumptions, my "lower capacity
18 price" sensitivity remains more reasonable than the Rose/ICF forecast used by the
19 Companies. When asked if Mr. Rose had produced or reviewed more up-to-date
20 capacity price forecasts, the Companies objected—which was in keeping with
21 their treatment of most requests for updated assumptions.³⁷

³⁵ Direct Testimony of Tyler Comings, p. 30, Figure 7

³⁶ Direct Testimony of Tyler Comings, p. 48, Table 7.

³⁷ Updated capacity price forecasts were requested in SC Set 10-INT-192. During the supplemental discovery period, Sierra Club served several requests that sought updated information about price forecasts and other assumptions that may have been prepared or reviewed by the Companies or their witnesses. *See, e.g.,* SC Set 10-INT-190 to -193, -195 to -209; SC Set 10-RPD-141. The Companies objected and refused to provide any information in response to these requests.

1 **Q Have the assumptions for environmental control risks changed since your**
2 **direct testimony was filed?**

3 **A I am unaware of any substantial changes to the environmental compliance**
4 assumptions that I discussed in my direct testimony.³⁸ I continue to maintain that
5 the Companies have failed to adequately address pending environmental
6 compliance costs. The Companies' new witness, Raymond Evans, provided
7 supplemental testimony that asserts otherwise. However, Mr. Evans does not
8 sufficiently address pending compliance. For instance, he refers to the current
9 effluent limitation guidelines (ELG) that were established in 1982, but not the
10 proposed ELG rule that is scheduled to be finalized in September 2015.³⁹

11 Mr. Evans also claims that the proposed ozone NAAQS will not directly affect the
12 Sammis plant, and that Sammis will not be required to install any new selective
13 catalytic reduction ("SCR") controls to control NOx emissions from the plant.⁴⁰
14 His explanation includes the fact that the ozone monitor in Jefferson County is
15 upwind of Sammis, concluding that the plant "is not a direct contributor to any
16 ozone issues measured in Jefferson County."⁴¹ Mr. Evans cites 2013-2015 levels--
17 even though 2015 is not even halfway over--as evidence that ozone levels have
18 decreased. He also claims that "this trend should continue" but offers no evidence
19 that it will.

20 The Companies have not provided any air dispersion modeling of the impacts of
21 the proposed ozone standard on the Sammis plant and, therefore, have no basis for
22 their conclusion that there will be no new requirements for Sammis to reduce
23 emissions. Moreover, fortuitous monitor placement does not preclude large
24 emitters such as Sammis from having to address control requirements.

³⁸ Direct Testimony of Tyler Comings, p.30-43.

³⁹ Supplemental Testimony of Raymond Evans, p.5, lines 16-17.

⁴⁰ *Id.* at p. 17, lines 14-19.

⁴¹ *Id.* at p.17, lines 10-11.

1 **Q How would additional Selective Catalytic Reduction (“SCR”) investments**
2 **alone affect the Companies’ valuation?**

3 **A** Mr. Evans maintains that there is not a risk that SCR will be required at the
4 Sammis plant and does not discuss this possibility at all regarding the OVEC
5 plants. The Companies have offered no hard evidence—such as emission
6 modeling--that SCR would not be required. As I explained in my direct testimony,
7 Clifty Creek unit 6 and Sammis units 1-5 may be required to install SCR NO_x
8 controls in order to comply with future rules such as the EPA’s proposed ozone
9 NAAQS standards.⁴² A requirement to install SCR could also result from a
10 lawsuit brought by downwind states or local jurisdictions that are impacted by
11 NO_x emissions from Sammis or Clifty Creek. These installations would result in
12 more than \$400 million in capital costs that are not included in the Companies’
13 estimate of the proposed transaction’s value, and are not accounted for in the
14 Companies’ estimate of ratepayer benefits from Rider RRS.⁴³

15 The sensitivity analysis described in my direct testimony included SCR
16 installation costs for Clifty Creek unit 6 and Sammis units 1-5. This adjustment
17 alone reduced the projected value of Sammis by [REDACTED] to [REDACTED]
18 (compared to the Companies’ [REDACTED] valuation).⁴⁴ Assuming the
19 Companies would be liable for 4.85 percent of the SCR costs for Clifty Creek unit
20 6, the adjustment lowers the projected value of the OVEC units by [REDACTED] to
21 [REDACTED] (compared to the Companies’ [REDACTED] valuation).⁴⁵

22 **Q Do you agree with Mr. Evans that Sammis will “help Ohio meet the**
23 **requirements of the proposed CPP [Clean Power Plan]”?⁴⁶**

24 **A** No. Mr. Evans claims that EPA’s modeling of the Clean Power Plan assumes that
25 Sammis [REDACTED] and will therefore be valuable to Ohio’s compliance.⁴⁷

⁴² Direct Testimony of Tyler Comings, p.41-42.

⁴³ Direct Testimony of Tyler Comings, p.41, line 24 through p.42, line 2.

⁴⁴ Direct Testimony of Tyler Comings, p.48, Table 7.

⁴⁵ Direct Testimony of Tyler Comings, p.48, Table 8

⁴⁶ Supplemental Testimony of Raymond Evans, p.10, lines 16-17.

1 This is a surprising conclusion for several reasons. Firstly, EPA’s stated goal for
2 the Clean Power Plan is “to cut carbon pollution from power plants.”⁴⁸ It is
3 counterintuitive that continuing to operate the most carbon-intensive type of
4 generation resource – a coal plant – helps Ohio achieve carbon reductions
5 compared to operating less carbon-intensive resources. Secondly, the modeling
6 that Evans discusses was used by EPA to determine target state emission rates
7 after applying the four proposed building blocks for emission reduction: 1) heat
8 rate improvements at coal plants, 2) re-dispatch of existing natural gas combined-
9 cycle plants, 3) renewable and nuclear generation and 4) energy efficiency. The
10 results of modeling these four building blocks show what the state could achieve
11 as a target emission rate but are not prescriptive. EPA is not dictating how the
12 state achieves its goal since that is explicitly to be determined by the state. In fact,
13 EPA cautions against inferring individual plant’s operations and contribution to
14 compliance from its modeling:

15 The EPA is not making any assertions about specific units or
16 plants. The EPA recognizes the uniqueness and complexity of
17 individual power plants, and is aware that there are site-specific
18 factors that may prevent some EGUs [Electric Generating Units]
19 from achieving performance equal to state-level assumptions.⁴⁹
20

21 Finally, based on the modeling described above, Mr. Evans states that “the
22 operation of Sammis, combined with investment in the other building blocks,
23 represents Ohio’s least-cost strategy for complying with the Clean Power Plan.”⁵⁰
24 This is not necessarily true, as the EPA’s modeling is explained in the Regulatory
25 Impact Analysis of the proposed rule:

26 While IPM finds a least cost way to achieve the state goals
27 implemented through the rate-based constraints imposed in the
28 illustrative scenarios, individual states or multi-state regional

⁴⁷ Supplemental Testimony of Raymond Evans, p.13, lines 9-10.

⁴⁸ See: <http://www2.epa.gov/carbon-pollution-standards/clean-power-plan-proposed-rule>

⁴⁹ Goal Computation Technical Support Document, U.S.EPA, June 2014. Available here:

<http://www2.epa.gov/sites/production/files/2014-06/documents/20140602tsd-goal-computation.pdf>

⁵⁰ Supplemental Testimony of Raymond Evans, p. 11, lines 1-2.

1 groups may develop more cost effective approaches to achieve
2 their state goals.⁵¹

3
4 Mr. Evans is drawing an inappropriate conclusion that Sammis will help Ohio
5 comply with carbon reductions.

6 **Q As it stands, is the proposed transaction overvalued by the Companies?**

7 **A** Yes, for many reasons. The Companies' analysis assumes [REDACTED] energy prices
8 based in part on [REDACTED] natural gas prices; assumes [REDACTED] capacity prices,
9 despite decreased load expectations in PJM; and inadequately handles compliance
10 with pending environmental regulations. The sensitivity analysis presented in my
11 direct testimony showed that a lower energy price assumption, and either required
12 SCRs or a lower capacity price [REDACTED] the Sammis and OVEC plants [REDACTED]

13 [REDACTED].⁵²

14 **Q What are the implications of this overvaluation for the Companies'**
15 **customers?**

16 **A** If Rider RRS is approved, and the Companies enter into the proposed transaction
17 with FES, customers will be financially responsible for the costs and revenues of
18 the Sammis, Davis-Besse, and OVEC plants. Under even the most favorable
19 projections made by the Companies, ratepayers would experience a \$404 million
20 loss in the first three years of the proposed transaction, and would [REDACTED]
21 until [REDACTED]. If, as appears likely, the Companies' favorable projections of energy,
22 natural gas, carbon, and/or other environmental compliance prices do not pan out,
23 that [REDACTED] would be delayed and may [REDACTED] during the life of the
24 proposed transaction. As such, customers would likely face higher costs in the
25 near term than they would without Rider RRS, and if those plants do not become
26 consistently profitable in the future, customers would also face higher costs in the

⁵¹ Regulatory Impact Analysis for the Proposed Carbon Pollution Guidelines for Existing Power Plants and Emission Standards for Modified and Reconstructed Power Plants, U.S. EPA, June 2014, p. ES-4. available at <http://www2.epa.gov/sites/production/files/2014-06/documents/20140602ria-clean-power-plan.pdf>.

⁵² Direct Testimony of Tyler Comings, p. 50, Tables 9 and 10

1 long run than they would have in the absence of Rider RRS. For the reasons
2 explained in my direct testimony, the Companies' overvaluation of the transaction
3 means that the Companies' claimed \$770 million net present value in customer
4 benefits over the next 15 years is almost certainly overstated. This conclusion is
5 further buttressed by recent trends, which further indicate that the Companies
6 have overvalued this transaction.

7 **III. THE TRANSACTION COULD TURN THE BENEFIT OF LOW MARKET**
8 **PRICES TO RATEPAYERS INTO A VULNERABILITY**

9 **Q What is the "missing money problem" that the Companies now claim?**

10 **A** In supplemental testimony, the Companies' witness Lawrence Makovich testifies
11 that inefficiencies in power markets have led to a "missing money problem"
12 where coal and nuclear generators are not collecting enough revenue.⁵³ He claims
13 that:

14 In PJM, as in other markets, market-based cash flows for
15 energy and capacity are chronically and artificially too low to
16 cover the costs of a power supply portfolio that delivers
17 reliable and efficient electric service.⁵⁴

18 Due to this "problem," Dr. Makovich claims that the plants involved in this
19 transaction "can be exceptional assets from an operations perspective but
20 nevertheless be financially challenged."⁵⁵ He claims that the transaction addresses
21 this "problem" by "compensating the Plants for system benefits that are not
22 explicitly compensated for in the marketplace."⁵⁶

⁵³ Supplemental Testimony of Lawrence Makovich, p.3, line 23.

⁵⁴ Supplemental Testimony of Lawrence Makovich, p.6, lines 5-8.

⁵⁵ Supplemental Testimony of Lawrence Makovich, p.11, lines 9-10.

⁵⁶ Supplemental Testimony of Lawrence Makovich, p.12, lines 14-15.

1 **Q Does Dr. Makovich quantify the value at which he feels these plants should**
2 **be compensated?**

3 **A** No. Dr. Makovich presents a study on U.S. supply diversity but does not quantify
4 the additional value the plants should recover.

5 **Q Does Dr. Makovich mention low natural gas prices as a reason that energy**
6 **prices are low?**

7 **A** No. Dr. Makovich discusses price suppression caused by renewable energy
8 subsidies and mandates such as Renewable Portfolio Standards (RPS) that
9 contribute to the “missing money problem.”⁵⁷ He mentions that “there are other
10 contributors” but does not specify what they are.

11 The elephant in the room that Dr. Makovich does not address is natural gas prices
12 which, as I have shown previously, are currently low and expected to remain low
13 at least in the short-term. Even Companies Witness Rose acknowledged the
14 impact of low gas prices in his testimony:

15 Another key factor that unexpectedly lowered wholesale market
16 prices over the past few years was the decrease in natural gas
17 prices... Secondly, the surprising development of large natural
18 gas resources in PJM, especially Marcellus natural gas in western
19 PJM, also contributed to decreasing capacity prices.⁵⁸

20 **Q Is new generation in Ohio being built despite these low market prices?**

21 **A** Yes. Even under recent low prices, new capacity is being planned or coming on-
22 line. As I will discuss later, according to a recent new article, there are “at least
23 six gas-fired power plants [] being built or on the drawing boards in Ohio.”⁵⁹ The
24 Commission’s website states that there are 1,252 MW of new wind capacity that

⁵⁷ Supplemental Testimony of Lawrence Makovich, p.9, lines 2-7.

⁵⁸ Direct Testimony of Judah Rose. p.16, line 6 through p.17, line 1.

⁵⁹ Funk, John. “Gas-fired power plants sprouting in Ohio to replace old coal-burners”. The Plain Dealer.
April 9, 2015, attached as Exhibit TFC-38, and available at:

http://www.cleveland.com/business/index.ssf/2015/04/gas-fired_power_plants_sprout.html

1 is under construction or approved in Ohio.⁶⁰ The fact that new generation is
2 replacing old generation--while energy prices have been low and capacity prices
3 have not sharply increased--are indications of the markets working effectively.

4 **Q Are low market prices a problem that must be solved?**

5 **A** Not in my opinion. Low market prices may be problematic for owners of
6 uneconomic generation, but without Rider RRS they are not for ratepayers or the
7 broader Ohio economy. If the Companies sign on to this transaction, ratepayers
8 would be vulnerable to low market prices because they will become de-facto
9 generation owners. Without the transaction, low market prices would remain a
10 boon for ratepayers and the Ohio economy.

11 **IV. RIDER RRS EXPOSES RATEPAYERS TO MORE RISK AND DOES NOT**
12 **PROVIDE STABILITY**

13 **Q In the AEP Ohio Order, did the Commission consider the rider's claimed**
14 **stability benefits?**

15 **A** Yes. The Commission's Order made clear that rate stability issues will be
16 considered in evaluating future PPA rider proposals such as Rider RRS.⁶¹

17 **Q Did the Commission's Order find that AEP Ohio's PPA Rider would provide**
18 **stability for ratepayers?**

19 **A** No. The Commission discussed concerns over rate stability based on the many
20 uncertainties inherent in AEP Ohio's proposal. The Commission stated that:

21 [W]e are not persuaded that the PPA rider proposal put forth by
22 AEP Ohio in the present proceedings would, in fact, promote rate
23 stability, as the Company claims, or that it is in the public interest.
24 There is considerable uncertainty with respect to pending PJM

⁶⁰ See: <http://www.puco.ohio.gov/puco/index.cfm/be-informed/consumer-topics/where-does-ohioe28099s-electricity-come-from/#sthash.g1XcHWMO.dpbs>, attached as Exhibit TFC-39.

⁶¹ *Id.* at p. 24 ("The Commission agrees . . . that the evidence of record reflects that the rider may result in a net cost to customers, with little offsetting benefit from the rider's intended purpose as a hedge against market volatility."); *id.* at 25 ("As we have consistently emphasized in AEP Ohio's prior ESP proceedings, rate stability is an essential component of the ESP.").

1 market reform proposals, environmental regulations, and federal
2 litigation, as AEP Ohio acknowledges, and, in light of this
3 uncertainty, the Commission does not believe that it is appropriate
4 to adopt the proposed PPA rider at this time.⁶²

5 **Q Should these same concerns apply to the Companies' Rider RRS proposal?**

6 **A** Absolutely. As discussed in my direct testimony, under Rider RRS the ratepayers
7 would bear the entire risk of the proposed transaction with FES, since 100 percent
8 of the net costs and revenues are passed onto them. If Rider RRS is approved,
9 ratepayers would bear the costs of the transaction, and would financially stand in
10 the shoes of merchant generators that are vulnerable to market forces and
11 uncertainty. However, unlike merchant generators, ratepayers would have little
12 control of plant operations, costs, and strategic decisions such as compliance with
13 environmental regulations.

14 **Q Are there any solid protections for ratepayers in place under the Rider RRS**
15 **proposal?**

16 **A** No. The AEP Ohio Order stated that the AEP Ohio should "provide for rigorous
17 Commission oversight of the rider" and "include an alternative plan to allocate the
18 rider's financial risk between both the Company and its ratepayers."⁶³ There is
19 currently no binding contract in place and therefore nothing to adequately protect
20 ratepayers in this transaction. At present, there is only a term sheet, which
21 suggests that FES would incur minimal, if any, damages if it terminated the
22 agreement before the 15-year term is up, as the term sheet proposes that the
23 Companies would be foreclosed from pursuing indirect damages or lost profits in
24 the case of a breach.⁶⁴ Also, as it stands, the risks of the transaction are solely on
25 ratepayers, with no alternative plan for sharing those risks. If the plants were to
26 become profitable, FES may be able to back out of the transaction leaving
27 ratepayers without future profits. However, if the plants are unprofitable,

⁶² AEP Ohio Order, p.25.

⁶³ *Id.*

⁶⁴ See Exhibit TFC-11 (copy of term sheet, originally produced as IEU Set 1-INT-25 Attachment 1).

1 ratepayers could be stuck while FES would continue to receive a guaranteed
2 return on equity funded by ratepayers.

3 **Q Did the Companies claim that the transaction would provide retail rate**
4 **stability?**

5 **A** Yes. Witness Steven Strah claimed that the transaction “will stabilize retail
6 electric rates for all customers.”⁶⁵

7 **Q Is there evidence of retail rate instability in Ohio?**

8 **A** No. Even with the spike in wholesale energy prices that occurred in early January
9 of 2014, I have seen no evidence of retail rate instability. Looking at monthly
10 wholesale and retail prices shows that retail prices are much more stable.

11 Sierra Club requested such information from the Companies, but the Companies
12 refused to provide it. When asked whether the Companies’ ratepayers had faced
13 any volatility in retail rates over the past two years, the Companies refused to
14 answer.⁶⁶ Similarly, when recently asked to provide evidence that the transaction
15 provides retail rate stability, the Companies provided nothing.⁶⁷ Lacking any such
16 evidence from the Companies, I reviewed publicly-available EIA data showing
17 the monthly average retail price of electricity in Ohio. Figure 5 compares those
18 monthly retail prices to the monthly wholesale price of energy in the ATSI zone
19 (referred to as the Locational Marginal Price or LMP). While the wholesale prices
20 are somewhat smooth when compared to hourly and daily volatility, there was
21 still a prominent spike in prices for January 2014. However, monthly retail prices
22 in Ohio were stable at that time and in the following months. In fact, the highest
23 monthly retail rates in 2013 and 2014 occurred in July, not during periods of
24 extreme cold snaps in January 2014 and February 2015.

⁶⁵ Direct Testimony of Steven E. Strah, p.2, lines 10-11.

⁶⁶ SC Set 10-INT-189.

⁶⁷ Sierra Club submitted a discovery request to the Companies seeking information about the Companies’ claims that the ESP would “help stabilize retail rates.” SC Set 9-INT-166. The Companies objected to this request and refused to provide any information regarding this issue.

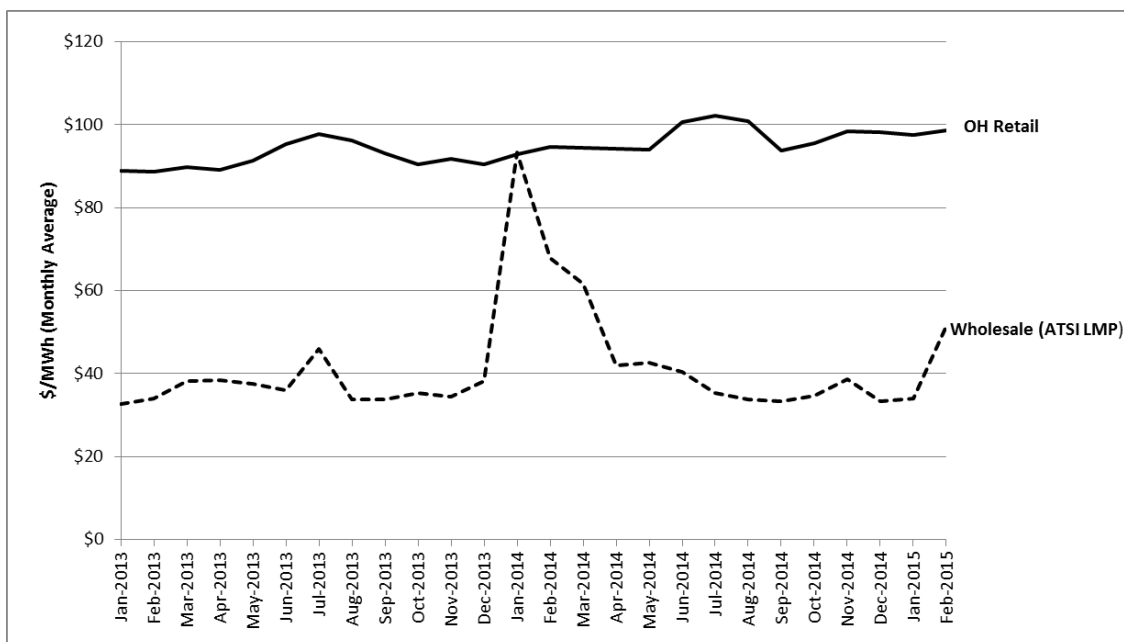


Figure 5: Comparison of Monthly Retail and Wholesale Prices (\$/MWh)⁶⁸

Q Are there already rate stabilizing factors in place in Ohio?

A Yes. In rejecting AEP Ohio’s PPA rider proposal, the Commission noted that:

...there are already existing means, such as the laddering and staggering of SSO auction products and the availability of fixed price contracts in the market, that provide a significant hedge against price volatility.⁶⁹

Based on the stable retail rates shown above, these existing mechanisms appear to be functioning properly. The Companies’ Rider RRS proposal--like AEP Ohio’s PPA rider—does not clearly provide more stability than already exists.

Q Did the Companies review any other rate stabilization options besides a transaction with FES?

A No. There is no evidence that the Companies considered any other option besides a transaction purchasing output from FES’s generating plants. The Companies

⁶⁸ EIA Average Retail Price of Electricity. Available here: <http://www.eia.gov/electricity/data/browser/>. PJM Day-Ahead Locational Marginal Price (LMP), ATSI zone monthly average. Available here: <http://www.pjm.com/markets-and-operations/energy/day-ahead/lmpda.aspx>

⁶⁹ AEP Ohio Order, p.24.

1 compounded this problem by modeling the proposed transaction using one set of
2 assumptions, ignoring market uncertainty and future environmental compliance
3 risk.

4 **Q If the Companies were to pursue a PPA, what do you recommend going**
5 **forward?**

6 **A** There has been no showing that there is retail rate volatility or other uncertainties
7 that are sufficient to justify either Rider RRS or the proposed transaction (which
8 the Companies refer to as a PPA). If it were decided, however, that the
9 Companies should pursue a PPA, I would recommend that the Companies issue a
10 Request for Proposals (RFP). If conducted properly, an RFP process would allow
11 the Companies to compare the viability of multiple options—not just one. As it
12 stands, the Companies have offered one option which shifts all of the economic
13 risks of Sammis, Davis-Besse, and the OVEC share away from FES and onto the
14 Companies’ ratepayers. A fixed price contract or an escalating price contract—
15 both traditional types of PPAs—would at least provide certainty for ratepayers.
16 The Companies’ proposed “PPA” with FES offers no certainty, since the costs
17 and revenues are unknown from year to year.

18 **V. THE COMPANIES’ SUPPLEMENTAL TESTIMONY OVERSTATES THE**
19 **POTENTIAL TRANSMISSION RELIABILITY COSTS IF RIDER RRS WERE**
20 **REJECTED.**

21 **Q Did the Commission’s Order find that AEP Ohio should address whether a**
22 **PPA rider is necessary for reliability?**

23 **A** Yes. The Commission stated that AEP Ohio should address many factors,
24 including “necessity of the generating facility, in light of future reliability
25 concerns.”⁷⁰

⁷⁰ AEP Ohio Order, p.25.

1 **Q If Rider RRS were disapproved, would reliability problems arise?**

2 **A**It is unlikely. The Companies have avoided confirming that any of the plants
3 would retire if the proposed transaction with FES were not implemented, or if
4 Rider RRS were not approved. For this reason alone, the transmission costs
5 estimates presented in Mr. Phillips’s supplemental testimony, and in Ms.
6 Mikkelsen’s second supplemental testimony, are far from certain. In addition,
7 even if one or more of the generating units at issue were to be proposed for
8 retirement (as a result of the Rider’s disapproval), PJM has a mechanism designed
9 to prevent retirements from adversely impacting transmission reliability. This is
10 more fully addressed in the supplemental testimony of Sierra Club witness Peter
11 Lanzalotta.

12 **Q Did PJM offer better reliability during the cold snap of February 2015**
13 **compared to the cold snap in January 2014?**

14 **A**Yes. PJM’s highest winter peak load on record occurred on February 20, 2015—
15 exceeding the previous record from January 7, 2014 (i.e., during the Polar
16 Vortex). Despite the increase in peak load, the region offered better reliability
17 after applying lessons from the previous year. PJM’s “2015 Winter Operations
18 Update” shows that forced outages decreased from 22% in the 2014 cold snap to
19 13.3% in the 2015 cold snap.⁷¹ PJM attributes this to generators’ “more
20 heightened awareness,” “winter testing and winter preparation” and “improved
21 communication with PJM”.⁷² PJM also shows reduced the capacity that was off-
22 line due to fuel delivery constraints, which they attribute in part to “improved fuel
23 management strategies.”⁷³

⁷¹ PJM 2015 Winter Observations Update. April 7, 2015. Slide 7, attached as Exhibit TFC-40, and available at: <http://www.pjm.com/~media/committees-groups/committees/toa-ac/20150407/20150407-winter-update.ashx>

⁷² *Id.*

⁷³ *Id.*

1 **Q Did the Companies conduct a study of the reliability impacts of plants**
2 **involved in the transaction?**

3 **A Yes, in part. The Companies conducted an analysis of retiring the Sammis and**
4 **Davis-Besse plants both separately and together.⁷⁴ As discussed in the**
5 **supplemental testimony of Mr. Lanzalotta, the Companies did not analyze the**
6 **impacts of retiring individual units, despite this common occurrence elsewhere.**

7 **Q Have expectations of load growth decreased since the Companies' reliability**
8 **study was conducted?**

9 **A Yes. As I discussed previously, forecasts of PJM load in 2015 have decreased**
10 **throughout the region compared to PJM's 2014 load forecasts. In supplemental**
11 **testimony, there is no evidence that the Companies accounted for these decreased**
12 **load expectations.**

13 **Q Can both transmission upgrades and new generation enhance reliability?**

14 **A Yes. As explained in the supplemental testimony of Mr. Lanzalotta, in certain**
15 **circumstances new generation can provide additional reliability. However,**
16 **depending on the situation, new transmission upgrades may be preferable. Such**
17 **was the case in PJM when several Ohio coal plants announced retirement in 2012,**
18 **as mentioned by Mr. Phillips. As explained by the EIA, PJM decided to upgrade**
19 **transmission to take advantage of significant excess capacity elsewhere in the**
20 **region:**

21 Electric systems can ensure a reliable supply of electricity by building
22 new power plants, but in a highly populated area that requires significant
23 backup power in reserve, it may be more cost-effective to upgrade the
24 transmission system to improve the flow of power between regions. PJM
25 has an overall reserve margin of 29%, 13 percentage points above its
26 target, but the recently announced retirements created reliability concerns

⁷⁴ SC Set 1-RPD-9, Attachment 1 - Competitively Sensitive Confidential, attached as Competitively Sensitive Confidential Exhibit TFC-41.

1 that PJM plans to address through transmission upgrades, taking
2 advantage of the higher reserve margin elsewhere in the system.⁷⁵

3 The latest PJM auction results for 2017/2018--which account for retirements
4 announced through 2017—still resulted in a 20 percent reserve margin for the
5 region, 4 percent higher than the target reserve margin.⁷⁶ The Companies are
6 located in the ATSI zone, which cleared at the PJM RTO capacity price in the
7 most recent auction, meaning there were no capacity issues for the 2017/2018
8 delivery year in that region.⁷⁷ Thus, the Companies continue to take advantage of
9 the ample capacity in the rest of PJM.

10 Substantial future retirements and/or an increase in peak load in the ATSI zone
11 could necessitate future transmission upgrades, new generation, or a mix of the
12 two to maintain reliability.

13 **Q Is there new generation scheduled to come on-line in Ohio?**

14 **A** Yes. This includes the 800 MW Clean Energy Future-Lordstown natural gas
15 plant, which is expected to tie into the Highland-Sammis transmission line, which
16 is connected to the Sammis plant.⁷⁸

17 A recent article in the Plain Dealer entitled “Gas-fired power plants sprouting in
18 Ohio to replace old coal-burners” states that, according to state regulators, an
19 expected 4,300 MW of new gas capacity (including Lordstown) will come online
20 in Ohio by 2019.⁷⁹

⁷⁵ “Transmission upgrades compensate for coal-fired retirements in Ohio electric region”, EIA Today in Energy, September 3, 2013. Available here: <http://www.eia.gov/todayinenergy/detail.cfm?id=12791>

⁷⁶ PJM 2017/2018 Base Residual Auction Results, p.1. Available here: <http://www.pjm.com/~media/markets-ops/rpm/rpm-auction-info/2017-2018-base-residual-auction-report.ashx>

⁷⁷ *Id.*

⁷⁸ Generation Interconnection System Impact Study Report for PJM Generation Interconnection Request Queue Position Z2-028 Highland – Sammis 345kV and Highland – Mansfield 345kV. Available here: http://www.pjm.com/pub/planning/project-queues/impact_studies/z2028_imp.pdf

⁷⁹ Funk, John. “Gas-fired power plants sprouting in Ohio to replace old coal-burners”. The Plain Dealer. April 9, 2015. Available here: <http://www.cleveland.com/business/index.ssf/2015/04/gas-fired-power-plants-sprout.html>

1 **Q How does the size of the new Lordstown plant compare to the Sammis plant?**

2 **A Sammis units 1-5 provide a total 1,020 MW, offering slightly more capacity than**
3 the 800 MW Lordstown plant. Keeping Sammis unit 5 would only equate to a
4 capacity reduction of 720 MW, slightly less than the size of Lordstown.

5 **Q Did the Companies' supplemental testimony change the estimates of avoided**
6 **transmission costs due to the transaction?**

7 **A Yes. As discussed in Mr. LanzaLotta's supplemental testimony, the Companies**
8 presented supplemental testimony from a new witness, Rodney Phillips, which
9 adopts the direct testimony of the Companies' witness Gavin Cunningham but
10 then proceeds to offer a larger estimate of transmission costs than was presented
11 in Mr. Cunningham's testimony.

12 **Q Did the Companies attempt to characterize the value of avoided reliability**
13 **costs that are part of the value of the transaction?**

14 **A Yes, though only in supplemental testimony. Ms. Mikkelsen, in her second**
15 supplemental testimony, presents the net present value of Mr. Phillips's new
16 transmission cost estimates, suggesting that this is an additional benefit to
17 customers of the transaction and Rider RRS.⁸⁰ Ms. Mikkelsen lumps these
18 avoided costs together with the Companies' projected revenue of the generating
19 plants to arrive at a larger perceived benefit for customers.

20 **Q Have the Companies justified the inclusion of more than \$1 billion in avoided**
21 **transmission costs as a benefit of Rider RRS?**

22 **A No. For one thing, there is no solid evidence that FES will retire Davis-Besse**
23 and/or Sammis if Rider RRS is rejected. For another, it appears that the
24 Companies have failed to adequately consider reduced load expectations. More
25 generally, the Companies have not accounted for the increased reliability that
26 PJM experienced during the February 2015 cold snap. Given these factors, there
27 is no reason to believe that customers would face the transmission costs described

⁸⁰ Mikkelsen supplemental testimony workpaper

1 in Ms. Mikkelsen's second supplemental testimony and in Mr. Phillips's
2 supplemental testimony, if Rider RRS were not approved. In addition, the
3 Companies have not evaluated the reliability impacts and costs of retiring only a
4 subset of the Sammis units.

5 **Q Would it be reasonable to consider the potential for a subset of the Sammis**
6 **units being retired?**

7 **A** Yes. Sammis unit-by-unit operations and investment decisions can be made
8 separately. Compared to Sammis units 6 and 7, units 1-5 are smaller and are less
9 controlled with Selective Non-Catalytic Reduction (SNCR) controls for nitrogen
10 oxide, which are less effective than the SCRs installed on units 6 and 7.⁸¹ I have
11 not evaluated the economic viability of each Sammis unit individually, or the
12 transmission reliability impacts of retiring only a subset of the seven Sammis
13 units. However, I recommend that the Companies and Commission evaluate units
14 individually before deciding whether to pursue the proposed transaction.⁸²

15 **VI. THE ECONOMIC IMPACTS OF THE TRANSACTION REMAIN**
16 **INCOMPLETE AND FLAWED**

17 **Q Did the Commission's Order find that AEP Ohio should address the**
18 **economic development implications of the PPA rider?**

19 **A** Yes. The Commission stated that AEP Ohio should address many factors,
20 including, among other things, supply diversity and the economic development
21 implications if FES were to decide to retire the Sammis or Davis-Besse plants in
22 the future.⁸³

⁸¹ SC Set 1 -INT-54(a) Attachment 1 COMPETITIVELY SENSITIVE CONFIDENTIAL.

⁸² During the supplemental discovery period, Sierra Club submitted several requests that sought (a) additional information about the Companies' retirement-related reliability analysis, and (b) information about the Companies' contentions regarding reliability of the natural gas infrastructure. SC Set 9-INT-159; SC Set 10-INT-185 to -189. The Companies did not provide any information in response to these requests.

⁸³ AEP Ohio Order, p.25.

1 **Q How did the Companies present the economic impact of the transaction?**

2 **A The Companies’ Witness Sarah Murley conducted two economic impact analyses**
3 of the Sammis and Davis-Besse plants—one was provided in her direct testimony
4 and the other in supplemental testimony. The studies measure the total jobs, labor
5 income, and taxes generated by the plants using the IMPLAN model. In her direct
6 testimony, Ms. Murley concluded that Sammis and Davis-Besse “directly and
7 indirectly support approximately 2,921 jobs.”⁸⁴ Although this estimate was
8 misleading because it counted jobs outside of Ohio related to the Sammis plant.⁸⁵
9 Ms. Murley subsequently modeled the impacts on Ohio in her supplemental
10 testimony.

11 **Q Did Ms. Murley’s conclusions assume that nothing would replace Sammis or**
12 **Davis-Besse if those plants were to retire?**

13 **A Yes, implicitly. If Sammis or Davis-Besse were to retire, and that retirement**
14 caused a need for new capacity, then new builds would create short-term stimulus
15 through construction and long-term stimulus through operations. Given the
16 number of generating resources presently under development in Ohio, it is
17 reasonable to expect that a large amount of such new capacity would be built in
18 Ohio. Ms. Murley, however, did not weigh the economic impacts of operating
19 Sammis or Davis-Besse compared to the economic impacts of building and
20 operating new generation resources.⁸⁶

21 **Q Did Ms. Murley analyze the economic impacts on ratepayers from continuing**
22 **to operate Sammis and David-Besse compared to other sources?**

23 **A No. If Rider RRS were approved and the Companies proceed with the proposed**
24 transaction, rate impacts of operating Sammis or Davis-Besse that are passed on
25 to ratepayers may be higher or lower than alternative sources. An economic
26 impact analysis can account for such an impact, since ratepayers would have more

⁸⁴ Direct Testimony of Sarah Murley, p. 10, line 14.

⁸⁵ Direct Testimony of Sarah Murley, p. 6 and p.8.

⁸⁶ Murley deposition, p.128, lines 19-22 (excerpts attached as Exhibit TFC-42).

1 or less money to spend elsewhere in the state’s economy. Especially given that
2 even under the Companies’ overly-favorable projections, the proposed transaction
3 would cost ratepayers \$404 million over the first three years, and would not break
4 even until at least [REDACTED], such impacts should have been factored into the analysis.

5 **Q Did Ms. Murley originally model the impacts of the Davis-Besse and Sammis**
6 **units using the same industry pattern in IMPLAN?**

7 **A** Yes. Older versions of IMPLAN treat all types of electric generation the same,
8 whether it is nuclear, coal, natural gas, wind, solar, etc. Without any modifications
9 to the model, this leads to estimation of the same regional multipliers for very
10 disparate types of operations. For instance, modeling the Davis-Besse plant under
11 the generic IMPLAN industry pattern would lead to the result that coal and
12 natural gas are being purchased by the facility, when this is obviously not the
13 case. Likewise, the Sammis plant does not require uranium to operate, but without
14 any modifications to the IMPLAN model, this faulty assumption would carry
15 forward.

16 Unfortunately, in her direct testimony, Ms. Murley modeled the Sammis and
17 Davis-Besse plants without altering the IMPLAN model’s assumptions.⁸⁷ If she
18 were modeling the impacts of both plants on the same region—which she does
19 not—this would lead to the multipliers of each plant’s operations to be the same.

20 **Q Has IMPLAN rectified this issue in more recent versions?**

21 **A** Yes, to an extent. IMPLAN now differentiates among electricity generating
22 resources, offering nine different industry patterns: hydroelectric, fossil fuel,
23 nuclear, solar, wind, geothermal, biomass, and “all other” resources. While this
24 new breakdown continues to combine coal, natural gas, and oil generation under
25 the “fossil fuel” generation activity—it is certainly a step in the right direction.

⁸⁷ Murley deposition, pp. 99:23 to 100:18, 119:24 to 120:16.

1 **Q Previous to IMPLAN’s latest version, were there “work-arounds” to model**
2 **impacts of different generating resources?**

3 **A** Yes. At Synapse, I have authored several reports that measure the impacts of
4 different generating resources using the IMPLAN model.⁸⁸ For these studies,
5 Synapse used customized industry patterns for each generating resource, partially
6 relying on data from the National Renewable Energy Laboratory (NREL) JEDI
7 model.

8 **Q Did Ms. Murley rectify this error in her supplemental testimony?**

9 **A** Yes, somewhat. Ms. Murley used the updated IMPLAN model discussed above
10 and, as previously, did nothing to alter the model’s industry patterns. While the
11 “nuclear generation” industry should be sufficient for modeling the David-Besse
12 plant, using the “fossil fuel generation” sector for the Sammis plant’s operations
13 is overly simplistic. This methodology effectively treats Sammis as an
14 agglomeration of coal, natural gas and oil plant operations in Ohio.

15 **Q Does the Commission have a clear depiction of the economic impact of the**
16 **transaction?**

17 **A** No. Ms. Murley’s analysis is flawed for the reasons I discuss above. She has
18 sought to correct misleading aspects of her initial analysis by since providing
19 impacts on Ohio and differentiating among generation resources—albeit
20 insufficiently regarding the Sammis plant. In keeping with the other aspects of the
21 Companies’ filing, Ms. Murley’s analysis treats the retirement of Sammis and
22 Davis-Besse in a vacuum—as if no new generation would be built in replacement

⁸⁸ See: Stanton, Liz et al. Economic Impacts of the NRDC Carbon Standard. June 20, 2013. Available here:
http://synapse-energy.com/sites/default/files/SynapseReport.2013-06.NRDC_Economic-Impacts-of-NRDC-Carbon-Standard.13-014.pdf

See: Comings, Tyler et al. Employment Effects of Clean Energy Investments in Montana. June 5, 2014.
Available here: http://synapse-energy.com/sites/default/files/SynapseReport.2014-06.MEIC_Montana-Clean-Jobs.14-041.pdf

1 that would also create jobs. As it stands, there is no clear depiction of the net
2 economic impact of the transaction.

3 **VII. FINDINGS AND RECOMMENDATIONS**

4 **Q What are your findings?**

5 **A** After reviewing the AEP Ohio Order and more up-to-date information that
6 became available since my direct testimony was filed, I find that:

- 7 1. The value of the proposed transaction with FirstEnergy Solutions Corp. –
8 and the potential savings to ratepayers under the proposed Retail Rate
9 Stability Rider (“Rider RRS”) – has likely decreased further given recent
10 market expectations;
- 11 2. The transaction could turn low market prices from being a benefit to a
12 vulnerability for ratepayers;
- 13 3. The transaction exposes ratepayers to further risk and would not provide
14 retail-rate stability;
- 15 4. The Companies have likely overstated whatever transmission reliability
16 cost savings might accrue from Rider RRS;
- 17 5. The Companies’ economic impacts analysis of the transaction is
18 incomplete and flawed.

19 **Q What are your recommendations to this Commission?**

20 **A** I continue to recommend that this Rider RRS be denied. It is inappropriate to tie
21 the fate of the merchant-owned coal units to ratepayers’ bottom line. The
22 transaction itself carries significant risk and uncertain benefits that are unlikely to
23 appear. Sammis and OVEC plants have been [REDACTED]
24 [REDACTED], and are subject to high regulatory risks in the near future, much of
25 which has not been accounted for in the Companies’ unsophisticated modeling.
26 Finally, as noted in this testimony, the Companies did not provide updates to key
27 information including changes to variable assumptions and more recent data on
28 revenue from the plants at issue. Unfortunately, there continues to be a troubling

1 lack of transparency in this proceeding from the Companies and FES that should
2 be rectified if the Commission wants a fair assessment of the transaction.

3 **Q Does this conclude your testimony?**

4 **A**Yes, it does. However, I reserve the right to update or supplement my testimony
5 based on new information that may become available.

Redacted

Redacted

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Redacted

5/11/15

Gas-fired power plants sprouting in Ohio to replace old coal-burners



Gas-fired power plants sprouting in Ohio to replace old coal-burners

John Funk, The Plain Dealer By **John Funk, The Plain Dealer**

Follow on Twitter

on April 09, 2015 at 7:00 AM, updated April 09, 2015 at 9:38 AM

CLEVELAND, Ohio -- At least six gas-fired power plants are being built or on the drawing boards in Ohio.

All are being built by independent power companies. They hope to capitalize on Ohio's plentiful and cheap shale gas, on the decision by companies like FirstEnergy to close old coal-burning power plants rather than upgrade them or replace them with natural gas plants, and on proposed federal rules requiring power companies to cut their carbon dioxide emissions.

The latest gas project to make the news is in shale gas-rich Carroll County, where a

Swiss power plant builder has begun grading parts of a 77-acre parcel about 2 miles outside of the county seat Carrollton. Carroll County Energy's 750-megawatt gas-fired power plant will have the capacity to generate enough electricity to power about 750,000 homes, on average.

Unlike conventional coal, the new plants combine gas turbines and steam boilers, making them far more efficient than coal-fired steam boilers. Also, these "combined cycle" gas-fired generators can ramp up to full power in minutes rather than hours or days that coal burners require.

On the downside, gas -- unlike coal -- cannot be stored at these power plants, and is delivered only by pipelines, leaving the power plants vulnerable to terrorists or natural calamities.

Advanced Power, the privately owned Swiss company building Carroll County Energy, partnered with a large retirement fund, a Japanese utility and two investment groups connected to insurance companies to raise a little more than half of the \$890 million construction costs. It secured a financing package from 10 large banks for the rest.

Ohio regulators recently told state lawmakers that they expect 4,300 megawatts of electricity to flow from



View full size

The high-voltage lines outside NRG Energy's Avon Lake power plant will continue to be needed after NRG converts the plant's coal-fired boilers to gas rather than closing them.

Marvin Fong, The Plain Dealer

5/11/15

Gas-fired power plants sprouting in Ohio to replace old coal-burners

new gas-fired power plants by 2019, most of it from plants owned by independent power companies.

At the same time, Ohio's old utilities are expected to close their coal plants. FirstEnergy, for example, is expected to close several old coal plants next week, including remaining boilers in Eastlake and at East 72nd Street off the East Shoreway in Cleveland.

This change-over is occurring as Ohio lawmakers are trying to decide whether to allow the state's energy efficiency standards to spring back to life automatically in 2017 as they are set to do under a temporary two-year freeze put in place last spring with the passage of a bill for which FirstEnergy heavily lobbied.

Energy efficiency programs can cut demand and that can reduce the pressure on utilities to scrap older coal-fired power plants, a study released last month by grid manager PJM Interconnection concluded.

Advanced Power has chosen the internationally ranked heavy construction company Bechtel to build the Carrollton plant. About 700 temporary jobs will be created. The company expects to be generating and selling electricity by December 2017.

The power will be sold into the regional high-voltage grid through a nearby 345,000-volt American Electric Power line.

The plant will take gas from Kinder Morgan's transcontinental Tennessee Gas Pipeline that runs through Ohio's Utica shale gas fields and northeast in the Marcellus shale gas fields in Pennsylvania. Some of Ohio's shale producers already use the line now to ship gas south to Louisiana.

Here are other gas-fired power plants already being built or planned.

- Developers began building the Oregon Clean Energy gas-fired power plant near Toledo in December at a cost of about \$850 million. The 799-megawatt gas fired plant will fill the gap left by FirstEnergy's decision to close some old coal-fired boilers nearby rather than retrofit or replace them to meet modern emission standards.
- Florida-based NTE Energy, another independent power company, is poised to begin construction of a 525-megawatt gas-fired power plant in Middletown, Ohio, in Butler County. That plant is projected to be on-line in early-to-mid 2018.
- The Rolling Hills power plant has been operating in Vinton County, Ohio, since 2003, and is now in the final stages of permitting to expand, add new technology, and boost its output from 850 megawatts to 1,414, enough power for more than a million households.
- Clean Energy Future-Lordstown, LLC, is proposing to build an 800-megawatt gas-fired plant in Trumbull County. The project, which will use gas from nearby pipelines and will connect to power lines owned by a FirstEnergy subsidiary, is under review at the Ohio Power Siting Board.
- NRG Energy, **is converting** its 725-megawatt coal-fired Avon Lake power plant to gas and is awaiting approval to build a 20-mile gas line from Dominion East Ohio and Columbia Gas of Ohio lines to its plant on Lake Erie. There has been opposition to the placement of the new gas line and a public hearing was

5/11/15

Gas-fired power plants sprouting in Ohio to replace old coal-burners

scheduled this week.

Edited to update temporary construction numbers at Carroll County Energy.

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Where does Ohio's electricity come from?

In Ohio, the majority of our electricity is generated using nonrenewable resources like coal, natural gas, nuclear and petroleum. While these resources are found naturally in the earth and produce large amounts of electricity, nonrenewable resources take a long time to form, and there is a limited supply available for people to use for power generation.

Renewable resources including hydropower, wind, biomass and solar energy are also used to produce electricity, but often on a smaller scale. These resources are readily available in nature and can be replenished relatively quickly.

The PUCO supports a mix of generation resources in order to minimize the risks, including price spikes, associated with an exclusive reliance on any one type of electric generation. Below are brief descriptions of the generation resources currently used in Ohio.

Coal, a nonrenewable fossil fuel, is used to generate 69.7 percent of the electricity in Ohio. Coal is burned to produce heat, which converts water into high-pressure steam. The steam turns the blades of a turbine that is connected to a generator. The generator spins and converts mechanical energy to electricity.

Natural gas, a nonrenewable fossil fuel, can either be burned to produce steam or to produce hot combustion gas that passes through the turbine blades. Approximately 15.56 percent of the electricity in Ohio is produced using natural gas and other gases.

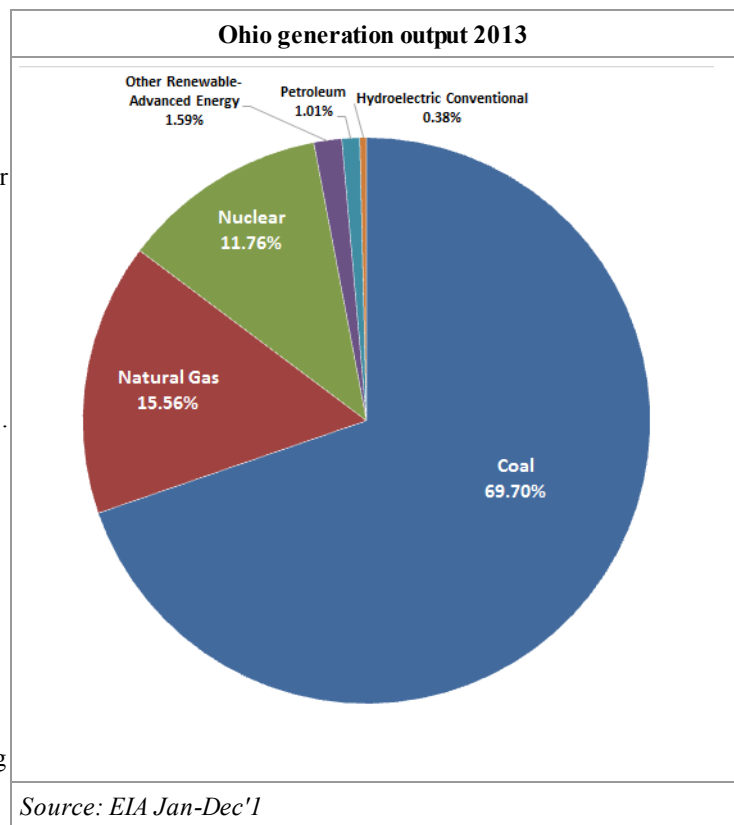
Petroleum, a nonrenewable fossil fuel, is burned to create steam to turn the turbine blades. The most common form of petroleum used to make electricity is fuel oil, a type of oil that is refined from crude oil. Petroleum generates approximately one percent of Ohio electricity.

Nuclear power involves a process called fission in which the atoms of the element uranium split, releasing heat to turn water into steam and rotate the turbine blades. Nuclear power is nonrenewable and is used to generate about 11.76 percent of Ohio electricity.

In **hydropower** generation, flowing water is used to spin the turbine connected to the generator. Hydropower plants can use the current from a river or falling water that has accumulated in a dam to create the force needed to turn the turbine blades.

Wind turbines harness the force of the natural wind to turn the generator turbine.

Solar power uses photovoltaic cells to harness the energy of the sun to produce energy.



Geothermal energy involves the heat buried beneath the surface of the earth. This heat transforms water into steam, which is then tapped to be used at steam-turbine plants.

Biomass energy resources include wood and wood wastes, landfill gas, biogas from food processing waste, animal waste, sewage sludge, and potential energy crops. The **Ohio Biomass Energy Program** (OBEP) works to promote the use of biomass in Ohio.

Snapshot of existing and planned renewable energy facilities in Ohio

Wind

- Timber Road Wind Farm II, 55 turbines, 100 MW*
- Blue Creek Wind Farm, 160 turbines, 350 MW*
- Northwest Ohio Wind, 59 turbines, 100 MW**
- Buckeye Wind Farm, 54 turbines, 135 MW***
- Buckeye II Wind Farm, 56 turbines, 140 MW***
- Hardin Wind Farm, 132 turbines, 211 MW***
- Hog Creek Wind Farm I & II, 43 turbines, 67 MW***
- Timber Road Wind Farm I & III, 60 turbines, 99 MW***
- Black Fork, 91 turbines, 200 MW***
- Scioto Ridge, 176 turbines, 300 MW***

* Operational

** Under construction

*** Approved (not yet under construction)

More information on wind

Solar

- Wyandot Solar Energy Generation Facility, 12 MW
- BNB Napoleon Solar, 9.8 MW
- First Solar Perrysburg Array, 2.4 MW
- Bryan Municipal Utilities, 2 MW
- Melink Solar Canopy at the Cincinnati Zoo, 1.6 MW
- Yankee Station Solar Generating Facility, 1.1 MW
- Centerburg High School Solar Array, 1 MW

Hydro and Other

- 130 MW hydroelectric capacity statewide
- 19 landfill gas projects of which nine generate electricity for a total capacity of 50 MW
- Biomass generation using waste residue to generate heat and power onsite in the wood manufacturing and paper industries

Ohio's renewable energy portfolio standard

Ohio law contains an alternative energy portfolio standard that requires that 12.5 percent of electricity sold by Ohio's electric distribution utilities or electric services companies must be generated from renewable energy sources by 2027

The law sets annual benchmarks, or incremental percentage requirements for renewable energy, through 2027. Each utility and electric services company is subject to compliance payments if the annual benchmarks are not met. Utilities and electric services companies may purchase renewable energy credits to meet the renewable energy standard.



2015 Winter Operations Update

April 7, 2015

TOA-AC

Chantal Hendrzak



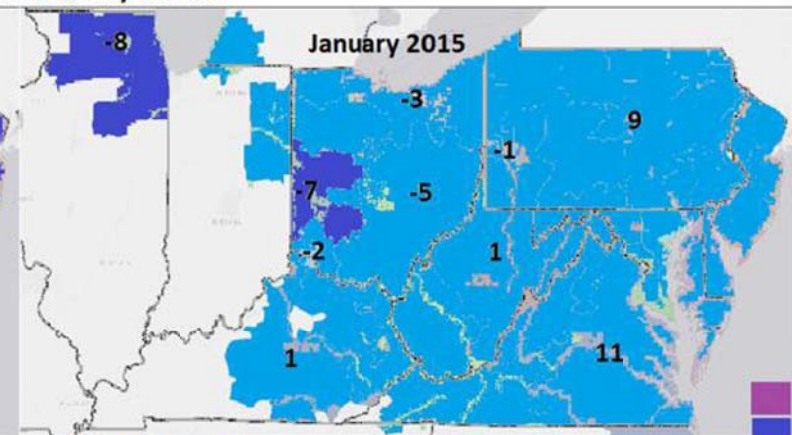
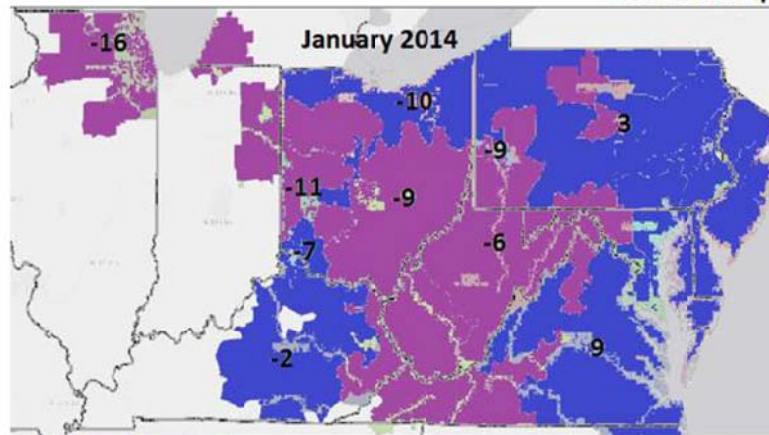
Winter Temperature Comparison 2014 vs 2015

2014

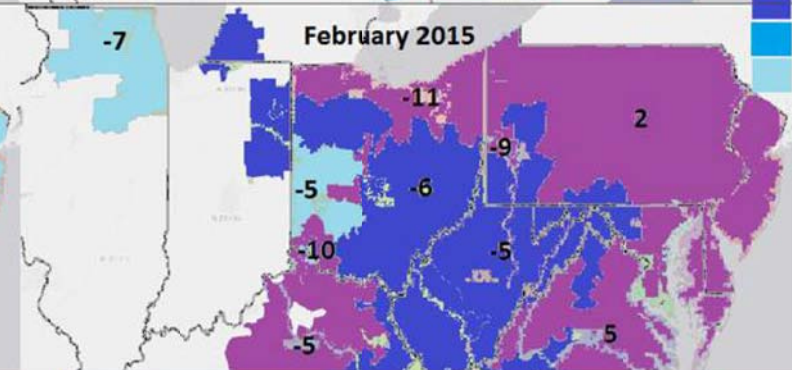
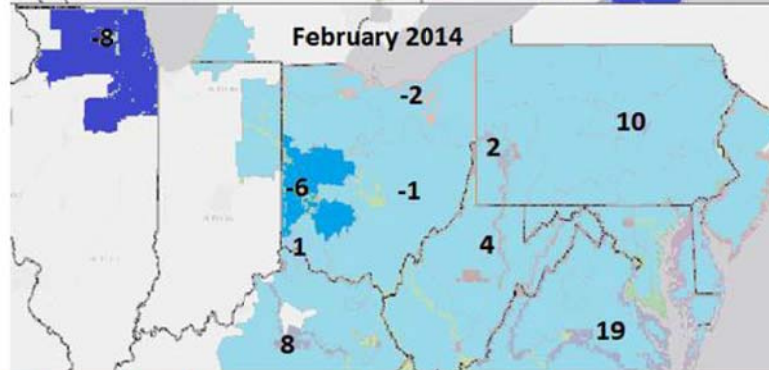
2015

Lowest Temperature by Month

January



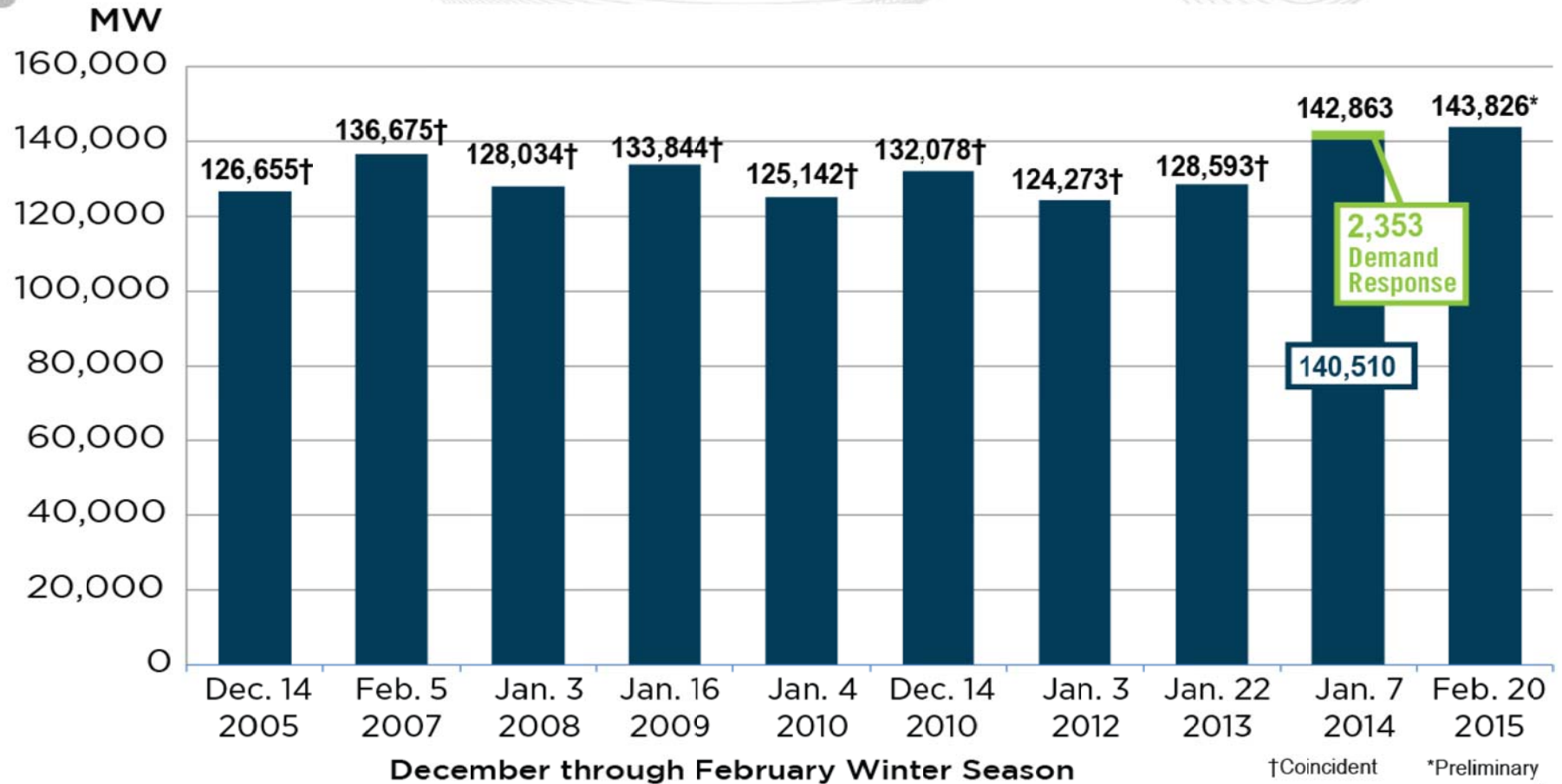
February



By Zone:
Coldest
↓
Least Cold



Historic RTO Winter Peak Demand





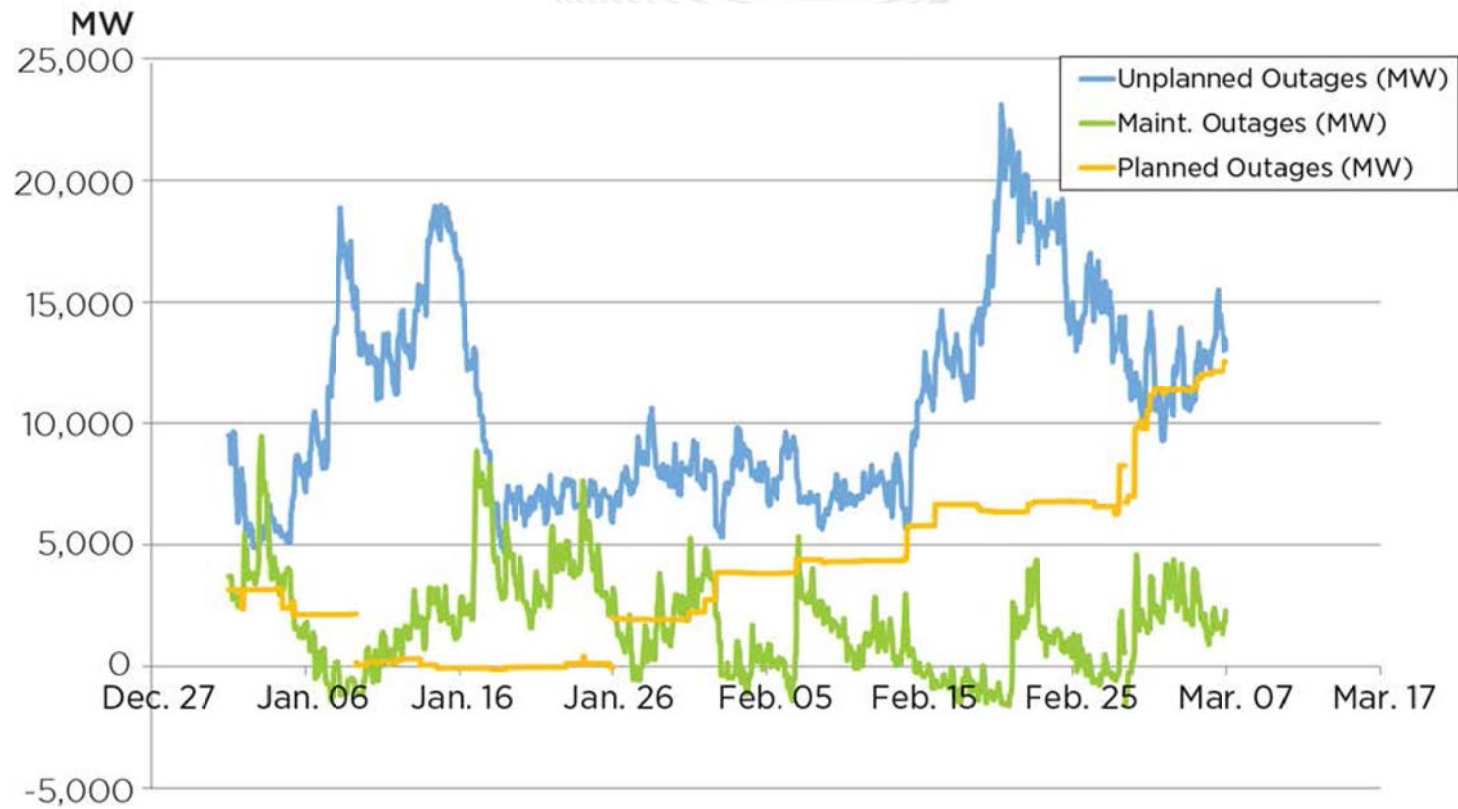
Generator Performance

Date	Total Forced Outages ALL fuel types (MW)	Forced Outage Rate	Total Forced Outages – Gas Availability Issues (MW)	% of Total Forced Outages due to Gas Availability Issues
2/19 Evening	19,996	10.78%	6,945	34.7%
2/20 Morning	24,805	13.34%	7,420	29.9%

NOTE: All outage numbers are approximate and will be finalized when GADs data is submitted and reviewed.

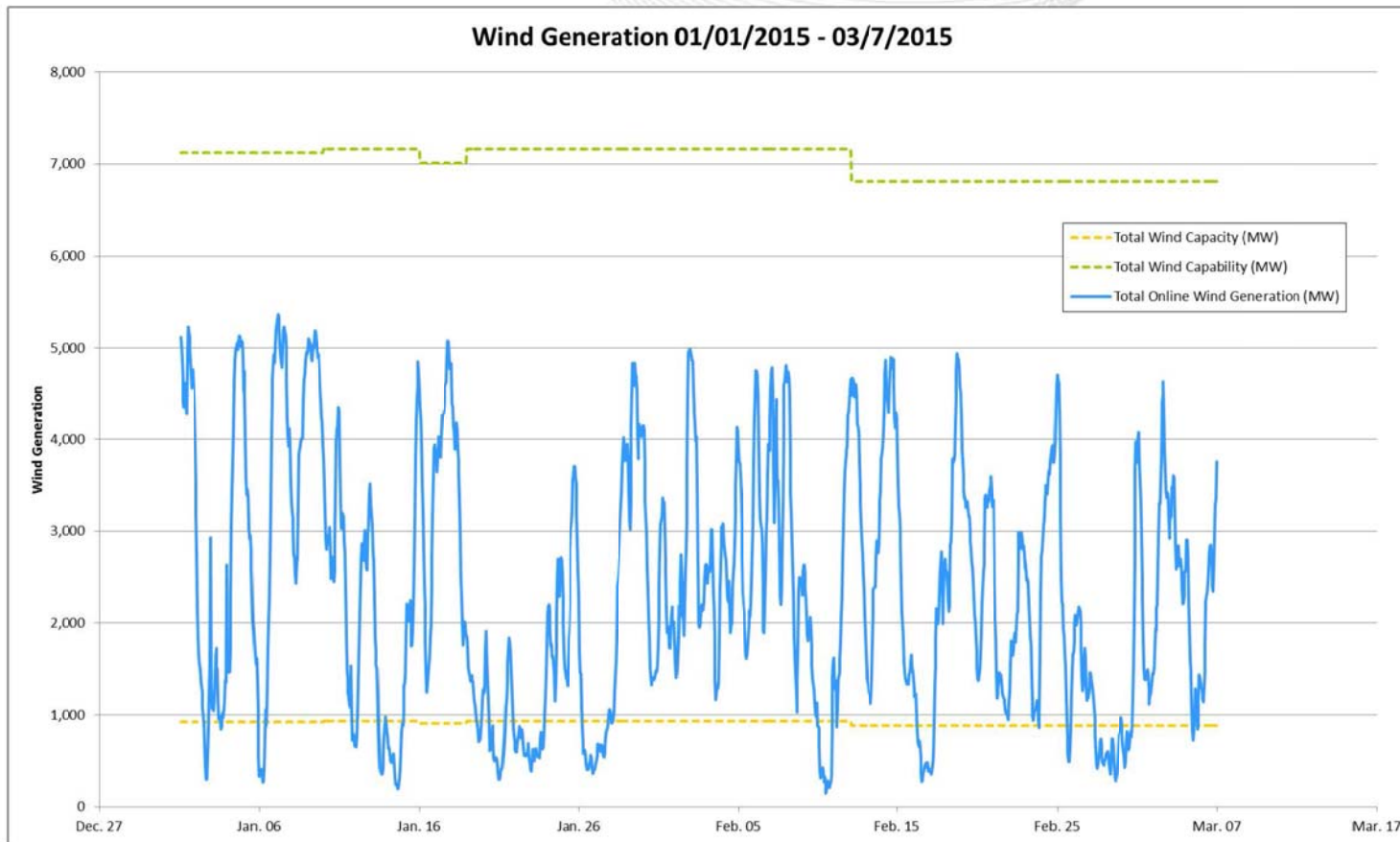


2015 Winter Unit Outages





2015 Winter - Wind



- January – up to 5,000 MW @ peak
- February – up to 3,000 MW @ peak



2015 Winter Observations

- Better generator performance:
 - 13.3% (2015) vs. 22% (2014) forced outage rate
 - More heightened awareness, winter testing and winter preparation (checklist)
 - Generators' start-up, cycle, and some offer behavior modifications
 - Improved communication with PJM (updating unit parameters in systems, discussing flexibility, submitting outage information)
- Gas procurement issues still present but better managed:
 - 7,420 MW or 29.9% (2015) vs. 9,500 MW or 24% (2014)
 - Fewer operational challenges with dual fuel units like emission limitations, fuel deliveries, less forced outages
 - Improved fuel management strategies (oil inventory, use of unit parameters, reporting)



GMD Event 3/17/2015



GMD Preparations (M-13 Section 3.7)

- Prepare (before the event)
 - Alerts/Warnings issued by Space Weather Prediction Center (SWPC) /NOAA typically 1-3 days in advance and monitored by PJM
 - Include Intensity (K-scale) and latitudes impacted
 - Notify members and neighbors as needed
 - Perform sensitivity studies ensure adequate system resiliency for future operating periods
 - Screen for loss of EHV capacitors, loss of major generating sites such as Artificial Island, loss of EHV transformers, etc.
 - Schedule additional generation if needed
 - Potentially delay/defer/restore transmission and generation outages



GMD Operations (M-13 Section 3.7)

- Monitor (during the event)
 - Meters are in place at ~50 stations to watch for GMD impacts in real time
 - Adjust/operate more conservatively based on system conditions
 - Coordinate with members, neighbors, etc. as the situation dictates



Timeline of notices

- **Relevant SWPC GMD postings**
 - 3/17 @1334 UTC (Coordinated Universal Time) (0934hrs Eastern)
 - K-7/G-3 poleward of 50-degrees for the period of 1200-1500 UTC.
 - 3/17 @1401 UTC
 - Upgraded to K-8/G4 poleward of 45-degrees for the period of 1200-1500 UTC.
 - 3/17 @1757 UTC
 - K-8/G4 poleward of 45-degrees through 1800 UTC.

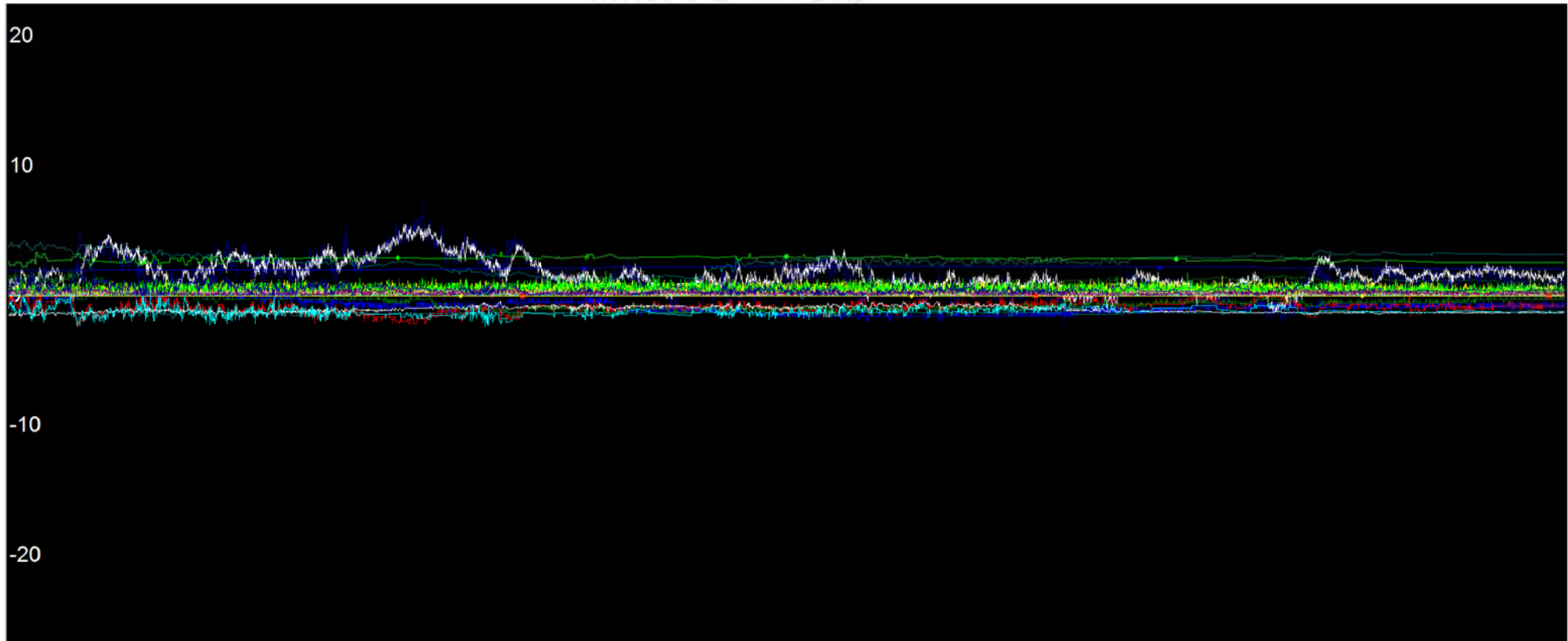


PJM Actions/observations

- Posted GMD notices to Emergency Procedures website
- Coordinated with Members and Neighbors to review geomagnetically induced current (GIC) meter data and system conditions
- Triggers for Conservative Operations were not met, but PJM studied the additional GMD contingencies to be prepared:
 - No overloads or low voltages were observed
- No GMD related impacts observed or reported on the system (internal or external)

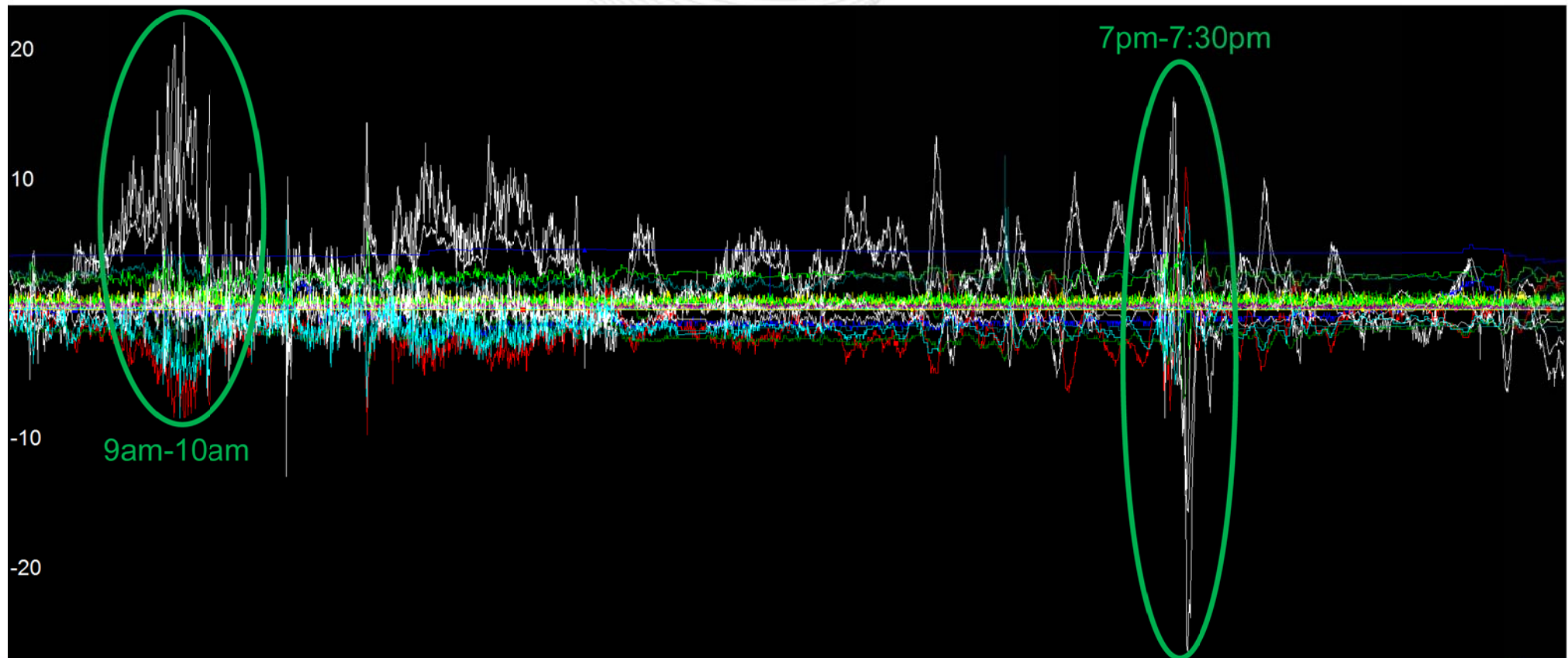


GMD on a 'normal day'





GMD Activity 3/17/2015



Redacted

IN THE PUBLIC UTILITIES COMMISSION OF OHIO

- - -

In the Matter of the :
Application of Ohio Edison:
Company, The Cleveland :
Electric Illuminating :
Company, and The Toledo :
Edison Company for : Case No. 14-1297-EL-SSO
Authority to Provide for :
a Standard Service Offer :
Pursuant to R.C. 4928.143 :
in the Form of an Electric:
Security Plan. :

- - -

DEPOSITION

of Sarah Murley, taken before me, Karen Sue Gibson, a
Notary Public in and for the State of Ohio, at the
offices of FirstEnergy Corporation, 76 South Main
Street, Akron, Ohio, on Wednesday, January 14, 2015,
at 8 a.m.

- - -

ARMSTRONG & OKEY, INC.
222 East Town Street, Second Floor
Columbus, Ohio 43215-5201
(614) 224-9481 - (800) 223-9481
FAX - (614) 224-5724

- - -

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11 On behalf of the Applicants.

12 Bruce E. Weston, Ohio Consumers' Counsel
13 By Ms. Maureen R. Grady(via speakerphone)
14 Assistant Consumers' Counsel
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17 On behalf of the Residential Consumers of
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19 Electric Illuminating Company, and The
20 Toledo Edison Company.

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Earthjustice
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Washington, D.C. 20036

On behalf of the Sierra Club.

Ohio Partners for Affordable Energy
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Findlay, Ohio 45846

On behalf of the Ohio Partners for
Affordable Energy.

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Mr. William Allen, AEP Ohio (via speakerphone).

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CROSS-EXAMINATION

By Ms. Hussey:

Q. Hi, Ms. Murley.

A. Yes. Hi.

Q. I wonder if you could turn to page 1 of your testimony.

A. Okay.

Q. And beginning at line 17, you testify that you performed many custom studies to quantify economic and physical impacts of utility generation facilities, and then in parentheses you list traditional and solar.

A. Yes.

Q. What do you mean by "traditional"?

A. Something other than solar.

MR. ALEXANDER: Did someone just join the call?

MR. DARR: Yes. This is Frank Darr. I just returned.

MR. ALEXANDER: Okay. Thank you.

A. Such as coal or nuclear or natural gas.

Q. Okay. Thank you. And I believe you spoke with Mr. Fisk a bit about your coal electric

1 generation plants and economic analyses. For the
2 sake of clarification, have you previously conducted
3 economic impact analysis for a coal-generation
4 facility?

5 A. Other than Sammis?

6 Q. Yes, other than Sammis.

7 A. No, not a coal-generation facility.

8 Q. Okay. What about a nuclear-generation
9 facility?

10 A. Yes.

11 Q. Okay. And are you able to tell us what
12 the facility may have been?

13 A. I'm sorry, can you repeat that?

14 Q. Are you able to tell us what facility
15 that was?

16 A. Palo Verde nuclear plant.

17 Q. Okay. Any other nuclear plants?

18 A. Other than Davis-Besse, no.

19 Q. Okay. Great. And what about natural
20 gas-generation facilities?

21 A. What's the question?

22 Q. What about natural gas-generation
23 facilities, electric generation facilities?

24 A. Do you mean -- what are you -- could you

1 repeat the question?

2 Q. Combined cycle type of a plant.

3 MR. ALEXANDER: Is the question has she
4 done an economic impact analysis for a natural gas
5 facility?

6 MS. HUSSEY: Correct.

7 A. Yes.

8 Q. Okay. And how many such analyses have
9 you performed?

10 A. For natural gas?

11 Q. Yes.

12 A. Two.

13 Q. And what about renewables, have you
14 performed economic impact analysis for renewable
15 generation?

16 A. For solar, yes.

17 Q. Okay. Any others?

18 A. Not that I recall.

19 Q. Thank you. And when you are asked to
20 perform an economic impact analysis, do you always
21 use the IMPLAN model?

22 A. Yes, I do.

23 Q. Okay. You explained a bit about how
24 IMPLAN can take industry-specific information into

1 account earlier.

2 A. Yes.

3 Q. And I wondered what -- what category of
4 industry-specific information you obtained from
5 IMPLAN when conducting the study.

6 A. Do you mean which industry category in
7 IMPLAN I used?

8 Q. Correct.

9 A. Electric power generation is a category
10 in IMPLAN. I believe that it may not be the exact
11 name but.

12 Q. Okay. And do you happen to know if
13 IMPLAN breaks that information down into categories
14 of electric generation, or is it all within the same
15 umbrella?

16 A. In the IMPLAN model I used all types of
17 electric generation are included in a single industry
18 category.

19 Q. Okay. Thank you. If I could talk to you
20 a bit about regional impacts. It appears that under
21 your analysis for Sammis you considered the impact on
22 a six-county regional area. And then for Davis-Besse
23 you regionally looked only at Ottawa County, and I
24 wondered why the regions that you analyzed for those

1 For purposes of your economic impact
2 analysis, did you assume that there were any
3 constraints on Sammis operating throughout the year?

4 A. I assumed that the output was based on
5 the amount of income and that the income and the
6 number of employees reflected the amount of hours
7 that those people worked and what amount of work was
8 required.

9 Q. And perhaps I am not making myself clear.
10 For purposes of this study, did you assume that
11 Sammis was -- what did you assume about Sammis
12 operations? Were you making an assumption that
13 Sammis is operating at 100 percent for the entire
14 study period?

15 A. I relied on the IMPLAN model as to the
16 normal level of operations for utility generation
17 plants.

18 Q. And do you know what the normal level of
19 operations or -- for utility plants, in particular
20 for a coal-burning plant, is in IMPLAN?

21 A. I do not know the specific assumptions
22 about the level of operations that they are assuming,
23 but it is inherent in those output multipliers.

24 Q. And we established earlier that -- or I

1 believe we established earlier, did we not, that the
2 assumptions made in IMPLAN related to the electric
3 generation were not plant specific?

4 A. That's correct.

5 Q. Or industry specific?

6 A. They are specific to the electric
7 generation industry.

8 Q. Right. But they are not specific by type
9 of plant, for instance, they do not delineate between
10 a coal-burning plant versus a gas-fired plant,
11 correct?

12 A. Correct.

13 Q. Also they would not delineate between a
14 coal-coal-burning plant and a solar facility,
15 correct?

16 A. Correct.

17 Q. For purposes of the economic impact
18 study, does the IMPLAN model assume full employment
19 is maintained?

20 A. I'm not sure I understand the question.

21 Q. With respect to -- you indicate that --
22 that as part of the economic impact analysis, there
23 are certain job assumptions made, correct?

24 A. The direct number of jobs are actual jobs

1 Q. But you are not making a recommendation
2 to the Public Utilities Commission of Ohio that the
3 results should be used in any particular way.

4 MR. ALEXANDER: Objection to the extent
5 it calls for a legal conclusion. Go ahead.

6 A. I'm not making a specific recommendation
7 about how the results should be used.

8 Q. Are you making a recommendation,
9 Ms. Murley, by presenting your economic impact
10 studies that the Commission approve the company's
11 application in this case?

12 A. I'm presenting my testimony on behalf of
13 the companies.

14 Q. Should the PUCO base its decision in this
15 case upon the results presented by your economic
16 impact study?

17 MR. ALEXANDER: Objection. Calls for a
18 legal conclusion. Go ahead.

19 A. I'm sure there are many factors that they
20 will consider.

21 Q. In your -- let me strike that.

22 Under the study that you present, the
23 economic impact analysis of Sammis and Davis-Besse,
24 can we tell whether or not the spending proposed for

1 those plants stimulates the economy more than any
2 other kind of investment?

3 A. That question is outside the scope of
4 what I analyzed.

5 Q. So you did not examine or compare the
6 benefits that could be obtained from using customers'
7 resources for other activities, correct?

8 A. That's correct.

9 Q. And did you examine in your benefit -- in
10 your cost -- in your economic impact analysis who
11 benefits and who pays for the Davis-Besse and Sammis
12 plant?

13 A. Those types of questions are outside of
14 the scope of economic impact analysis.

15 Q. And did you not consider the transfer of
16 money between customers and the utility as part of
17 your analysis?

18 A. That's a different type of analysis.

19 Q. Does your economic impact analysis
20 consider that support for these plants may displace
21 other investments that might otherwise occur?

22 A. I didn't look at that in my analysis.

23 Q. So you did not study the displacement
24 costs or consider whether other options may have

1 brought in even more positive economic impact?

2 MR. ALEXANDER: Objection, asked and
3 answered. Go ahead.

4 A. I don't believe I can improve upon my
5 answer.

6 Q. Can you tell me what the report that you
7 present -- let me strike that.

8 Let's go to your Attachment SM-1. And as
9 we've testified, the Sammis -- the economic impact
10 analysis for Sammis involved the tri-state region,
11 correct?

12 A. It involved six specific counties in
13 three states.

14 Q. Yes. And you also testified that you do
15 not know the Ohio-specific revenue and economic
16 impact of Sammis.

17 A. I didn't look at that.

18 Q. Now, you indicate that Sammis employs
19 close to 400 people. Do you see that reference?

20 A. No. Where are you looking?

21 Q. In the second paragraph on page 1, I'm
22 sorry.

23 A. Yes.

24 Q. Do you know whether that is full- or

CERTIFICATE OF SERVICE

I hereby certify that a true and accurate copy of the foregoing Supplemental Testimony was served upon the following parties via electronic mail on May 11, 2015.

/s/Christopher J. Allwein

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